

# A prospective examination of post-traumatic stress disorder in rape victims

William Walsh


*Journal of Traumatic Stress*

## Cite this paper

Downloaded from [Academia.edu](#) 

[Get the citation in MLA, APA, or Chicago styles](#)

## Related papers

[Download a PDF Pack](#) of the best related papers 



[An evaluation of three brief programs for facilitating recovery after assault](#)

Norah Feeny

[Randomized controlled evaluation of an early intervention to prevent post-rape psychopathology](#)

Carla Danielson

[Prevention of Post-Rape Psychopathology](#)

Ron Acierno

## **A Prospective Examination of Post-Traumatic Stress Disorder in Rape Victims**

**Barbara Olasov Rothbaum,<sup>1</sup> Edna B. Foa,<sup>1</sup> David S. Riggs,<sup>1</sup>  
Tamera Murdock,<sup>1</sup> and William Walsh**

---

*Post-traumatic stress disorder (PTSD) and related psychopathology were examined in 95 female rape victims beginning soon after the assault (mean = 12.64 days). Subjects were assessed weekly for 12 weeks. Ninety-four percent of women met symptomatic criteria for PTSD at Assessment 1, decreasing to 65% at Assessment 4 (mean = 35 days postassault), and 47% at Assessment 12 (mean = 94 days postassault). PTSD and related psychopathology decreased sharply between Assessments 1 and 4 for all women. Women whose PTSD persisted throughout the 3-month study did not show improvement after the fourth assessment; women who did not meet criteria for PTSD 3 months postassault showed steady improvement over time. This pattern was evidenced even after initial PTSD severity was statistically controlled. Moreover, PTSD status at 3 months postassault could be predicted with a high degree of accuracy by two brief self-report measures administered at the first assessment. The implications of the present findings and directions for future research are discussed.*

---

**KEY WORDS:** PTSD; rape; victimization; victims.

### **INTRODUCTION**

Post-traumatic stress reactions have been described in the literature under various names for over 100 years: hysteria (Putnam, 1881), nervous shock (Page, 1885), compensation neurosis (Rigler, 1879), traumatophobia (Rado, 1942), and war neurosis (Grinker and Spiegel, 1943). The use of

<sup>1</sup>Department of Psychiatry, Medical College of Pennsylvania at Eastern Pennsylvania Psychiatric Institute, Philadelphia, Pennsylvania.

general terms such as compensation neurosis and traumatophobia reflects an awareness that different traumatic experiences produce similar symptoms. As early as 1941, Kardiner provided an elaborate description of the post-trauma syndrome that included irritability, an exaggerated startle response, outbursts of aggression, fixation on the trauma, disrupted personality functioning, and disturbed dreams. These symptoms are remarkably similar to those included in current descriptions of Post-traumatic Stress Disorder (PTSD) (APA, 1987).

Burgess and Holmstrom (1974) noted that many rape victims experience similar reactions following their assault. The authors described a two-phase reaction, consisting of an acute phase and a reorganization phase, that the authors termed rape trauma syndrome. The acute phase was characterized by disorganization lasting from several hours to several weeks and including both "impact reactions" (e.g., shock, disbelief) and "somatic reactions" (e.g., physical trauma). The reorganization phase was described as a long-term process consisting of active lifestyle changes (e.g., changing residences) and long-term chronic disturbances such as nightmares and fears.

The most persistent reactions following rape appear to be intense fears of rape-related situations and general diffuse anxiety. These reactions have been reported up to 16 years after the assault (Calhoun *et al.*, 1982; Ellis *et al.*, 1981; Kilpatrick *et al.*, 1981). While depression is also a common reaction to rape, it appears to be less persistent (Atkeson *et al.*, 1982; Frank and Stewart, 1984; Frank *et al.*, 1979; Kilpatrick *et al.*, 1979a, b). In addition to anxiety and depression, rape victims report intrusive thoughts and images of the assault that they actively attempt to avoid (Kilpatrick and Veronen, 1984; Resick, 1987). Rape victims also report more sleep disturbance including nightmares and insomnia (Ellis *et al.*, 1981; Nadelson *et al.*, 1982) and more difficulty concentrating (Nadelson *et al.*, 1982) than nonvictimized controls.

Many symptoms that emerge following rape are included among the criteria for PTSD. Indeed, postrape symptoms correspond to the three symptom classes defining PTSD according to the DSM-III-R (APA, 1987): reexperiencing of the traumatic event (e.g., nightmares and flashbacks), avoidance and numbing (e.g., avoidance of thoughts and reminders of the trauma), and increased arousal (e.g., problems in sleeping and concentrating, exaggerated startle reactions). Research indicates that the post-assault psychopathology of rape victims may best be described as post-traumatic stress disorder. For example, Resnick *et al.*, (1989) found that 76% of rape victims met the diagnostic criteria for PTSD at some point within a year after the assault.

Although the available studies provide a rich picture of the postrape sequelae, they suffer from several limitations. In many studies, the data were collected retrospectively and thus were subject to memory bias. Second, the few prospective studies did not assess the same victims repeatedly, i.e., they reported cross-sectional rather than longitudinal data. Thus, information about the development and the course of postrape psychopathology has been unavailable to date. The present study was designed to remedy these limitations. It aimed to examine prospectively the development of PTSD and other related disturbances following rape in order to detect patterns of recovery and early indicators for later PTSD. Toward this end, rape victims were assessed weekly for 12 weeks beginning soon after the assault. It was expected that victims, as a group, would show a decline in symptoms over the course of the study. Furthermore, we hypothesized that the recovery patterns of victims who met diagnostic criteria for PTSD at the final (12 week) assessment would differ from the recovery pattern of victims without PTSD three months after the assault.

## METHOD

### Subjects

Subjects in this study were 95 female victims of rape or attempted rape. With the exception of four women, all victims had been assaulted within 30 days of the initial interview. The average time elapsed between the assault and the initial interview for the entire sample was 12.64 days (SD 9.39). Subjects were recruited primarily from an inner city hospital to which rape victims are routinely brought by the police. Other referrals came from local mental health professionals, crime victim services, police officers, and publicity efforts. Subjects were reimbursed \$20.00 per session for their participation with an additional \$30.00 at the last assessment if they completed all sessions.

Inclusion criteria were as follows: females between the ages of 17 and 65; victims of rape or attempted rape within the past month; and literate in English. Exclusion criteria were as follows: previous diagnosis or current presence of organic mental disorder, schizophrenia, or paranoid disorders as defined by the DSM-III-R; and a victim of a rape perpetrated by a spouse or family member or as part of an ongoing abusive relationship.

Subjects were excluded from the study if they missed more than two assessments. Thus, subjects who completed at least 10 assessments including the final assessment were considered "completers." All other subjects were considered "noncompleters."

The demographic characteristics are presented separately for completers and noncompleters in Table I. The majority of women in this study were black (65%), unmarried (76% never married, 15% previously married), and of low socioeconomic status (i.e., 60% had income less than \$10,000 per year).

**Table I. Demographic Characteristics of Completers and Noncompleters**

	All subjects (N = 95)	Completers (N = 64)	Noncompleters (N = 31)	Sig. test.
<b>Race (percentage)<sup>a</sup></b>				
Black	65	67	61	$\chi^2 = 2.22$
White	30	29	32	$p = 0.528$
Other	4	3	6	
<b>Marital status (percentage)<sup>a</sup></b>				
Single	76	75	77	$\chi^2 = 1.387$
Married/co-habiting	9	8	13	$p = 0.499$
Divorced/separated/widowed	15	17	10	
<b>Education (percentage)<sup>a</sup></b>				
Graduate degree	7	6	10	$\chi^2 = 1.20$
At least B.A./B.S.	9	11	6	$p = 0.88$
Some college	33	34	29	
High school graduate	28	27	32	
<High school graduate	22	22	23	
<b>Income (percentage)<sup>a</sup></b>				
30K+	4	5	3	$\chi^2 = 2.28$
20-30K	8	9	6	$p = 0.81$
15-20K	13	9	19	
10-15K	15	14	16	
5-10K	22	22	23	
<5K	37	39	32	
Missing	1	2		
<b>Occupation (percentage)<sup>a</sup></b>				
Manager/professional	13	12	16	
Clerical	16	16	16	$\chi^2 = 8.74$
Skilled	9	11	6	$p = 0.19$
Semi or unskilled	35	30	43	
Homemaker	6	9	0	
Student	4	6	0	
Unemployed	16	16	16	
Mean age	26.79 (6.37)	26.66 (6.53)	27.06 (6.08)	$t = 0.29$ $p = 0.78$
Mean days since assault	12.64 (9.38)	12.21 (8.67)	13.53 (10.82)	$t = 0.63$ $p = 0.53$

<sup>a</sup>Percentages do not always add to 100 due to rounding.

## Measures

Assessments in this study included interviews and standardized self-report measures.

### *Interviews*

The *Initial Interview*, lasting approximately 90 min, was conducted at the first assessment only. It contained 305 questions used in previous studies of rape victims (e.g., Resick, 1987). Questions addressed the following areas: demographic data, school and employment functioning, PTSD symptoms, alcohol and drug use, information about the assault, and immediate reaction to the rape.

The *Assault Reaction Weekly Interview*, lasting 30 min, was conducted at each of the remaining assessments. It contained 117 questions selected from the initial interview. These questions addressed the victim's reactions to the assault including: PTSD symptoms, changes in life style, sexual behavior, physical and psychiatric problems, and legal issues.

The reliability of both interviews was established on a pilot sample of 15 rape victims not included in the current study. Interrater reliability (percentage agreement) was 0.90 for each interview. New interviewers were trained until they reached this level of reliability on both interviews.

*PTSD Diagnosis and Severity.* Interview items corresponding to the DSM-III symptoms of reexperiencing, numbing, and arousal were used in conjunction with the avoidance items of the Impact of Events Scale to diagnose PTSD. This method resulted in diagnostic criteria for PTSD that were consistent with DSM-III-R (American Psychiatric Association, 1987). Responses to these items were used to assess PTSD at each of 12 assessments. Severity of PTSD was calculated by adding the interviewer's rating of severity of each of the following PTSD symptoms: reliving experiences, nightmares, flashbacks, avoidance of reminders and thoughts of the assault, impaired leisure activities (e.g., reduced socializing), sense of detachment, blunted affect, disturbed sleep, memory and concentration difficulties, hyperalertness, increased startle response, feelings of guilt, and increased fearfulness.

Psychometric properties of the interview items used to diagnose PTSD were examined using a sample of rape and nonsexual assault victims ( $N = 28$ ) not included in the present study. Inter-rater reliability was 0.90 (Kappa) for the diagnosis of PTSD (presence/absence) and  $r = 0.97$  (Pearson product moment correlations) for severity. Strong relationships were found between the PSS and the Intrusion subscale of the IES ( $r = 0.73$ ), the avoidance subscale of the IES ( $r = 0.63$ ), and the RAST ( $r = 0.79$ ).

### *Self-Report Measures of PTSD-Related Symptoms*

The *Rape Aftermath Symptom Test* (RAST; Kilpatrick, 1988) is a 70-item self-report inventory of psychological symptoms and potentially fear-producing stimuli rated on a 5-point Likert scale (range 0-280). It includes items from the Derogatis SCL-90-R and the Veronen-Kilpatrick Modified Fear Survey that differentiated rape victims from nonvictims. The reported internal consistency was 0.95 and test-retest reliability was 0.85 for non-victims.

*Impact of Event Scale* (IES; Horowitz *et al.*, 1979) is a 15-item self-report questionnaire measuring two dimensions of PTSD: trauma-related intrusion and avoidance. The frequency of these symptoms is indicated on a 4-point scale. Horowitz *et al.* reported split-half reliability for the total scale to be 0.86, internal consistency of the subscales (Cronbach's alpha) to be 0.78 for intrusion and 0.80 for avoidance, and test-retest reliability (1 week) to be 0.87. The IES was found sensitive to therapy effects in rape victims (Kilpatrick *et al.*, 1988).

### *Self-Report Measures of General Psychopathology*

The *State-Trait Anxiety Inventory* (STAI; Spielberger *et al.*, 1970) contains 40 items, 20 for state anxiety and 20 for trait anxiety. Test-retest reliability for trait anxiety was 0.81; as expected, figures were lower for state anxiety (0.40). Internal consistency ranges from 0.83 to 0.92.

The trait-anxiety scale was not included in the study since it is designed to measure a stable characteristic that was not hypothesized to change weekly.

The *Beck Depression Inventory* (BDI; Beck *et al.*, 1961) is a 21-item inventory measuring depressed mood and vegetative symptoms of depression. The inventory has split-half reliability coefficient of 0.93. Correlations with clinician ratings of depression range from 0.62 to 0.66.

## **Procedure**

Emergency room staff described the study to rape victims and obtained permission for our interviewers to contact them. Researchers arranged appointments by telephone and conducted assessments either at the Center for the Treatment and Study of Anxiety at Eastern Pennsylvania Psychiatric Institute of the Medical College of Pennsylvania or at a satellite office in South Philadelphia.

Assessments were conducted weekly for 12 weeks. The first session lasted approximately 2-1/2 hr, and the remaining sessions were one hour each. At each assessment victims were first interviewed using the structured

interviews and then completed the self-report questionnaires. All sessions were conducted by a female interviewer holding an advanced degree (M.A., Ph.D.) in psychology. With few exceptions, the same interviewer conducted all assessments for a given subject.

Analyses were conducted in three stages. First, demographic characteristics and initial symptom levels of completers and noncompleters were compared and the relation between the time since assault and initial symptom levels was examined. Second, repeated measures MANOVAs were conducted followed by univariate ANOVAs to compare symptom patterns of victims who met diagnostic criteria for PTSD at the final (12 week) assessment to those who did not. Because victims were grouped based on the presence or absence of PTSD, we thought that the inclusion of PTSD symptom severity in the MANOVA might bias the results. Therefore, we analyzed differences in PTSD symptom severity separately from the other psychopathology measures. Third, a discriminant function analysis was conducted to determine if self-report instruments completed at the initial assessment could accurately identify rape victims who would meet diagnostic criteria for PTSD 12 weeks later.

## RESULTS

### Preliminary Analyses

#### *Demographic Characteristics*

Of the 95 women who entered the study, 64 were completers. Characteristics of the entire sample and of completers and noncompleters are presented in Table I. Chi-square tests, in the case of discrete variables, and *t* tests in the case of continuous variables, revealed that the demographic characteristics of noncompleters did not differ significantly from those of completers.

#### *Psychopathology*

To explore possible differences in initial psychopathology between completers and non-completers, means and standard deviations for each measure were computed separately for the two groups (see Table II). *t* tests revealed no significant differences between the two groups in the initial psychopathology. The absence of initial differences suggests that the completers are representative of the entire sample.



**Table II.** Initial Symptom Levels of Completers and Noncompleters

	Completers	Noncompleters	<i>t</i>	<i>p</i>
PTSD symptom total	22.89 (7.24) <i>N</i> = 64	22.33 (5.60) <i>N</i> = 31	-0.37	0.709
RAST	149.72 (51.60) <i>N</i> = 60	138.25 (56.46) <i>N</i> = 31	-0.97	0.333
RIES AVOIDANCE	27.71 (7.57) <i>N</i> = 64	26.45 (7.44) <i>N</i> = 30	-0.76	0.452
RIES INTRUSION	24.90 (7.84) <i>N</i> = 64	24.43 (6.84) <i>N</i> = 30	-0.28	0.780
STAI STATE	52.96 (10.05) <i>N</i> = 57	52.49 (9.89) <i>N</i> = 26	-0.25	0.854
BECK	58.35 (12.90) <i>N</i> = 64	58.13 (10.42) <i>N</i> = 30	-0.08	0.935

### *Relationship Between Level of Psychopathology and Time Since Assault*

Victims differed with respect to the time elapsed from the assault to their first assessment. In order to examine whether initial severity of symptoms was higher in more recent victims, Pearson Product Moment Correlations were calculated between days since the assault and each of the pathology measures (RAST, IES, BDI, STAI). With an *N* = 95, correlation coefficients ranged from 0.008 to 0.10 indicating no association between time elapsed since the assault and initial symptom severity. The number of days since assault was also unrelated to the severity of specific PTSD symptoms; correlation coefficients ranged from 0.005 to 0.27.

### **Longitudinal Analyses**

#### *Incidence of PTSD Post Rape*

The week by week incidence of PTSD in the 64 completers is presented in Fig. 1. Incidence of PTSD decreased over time with a steady decline occurring over the first five assessments. At the initial interview

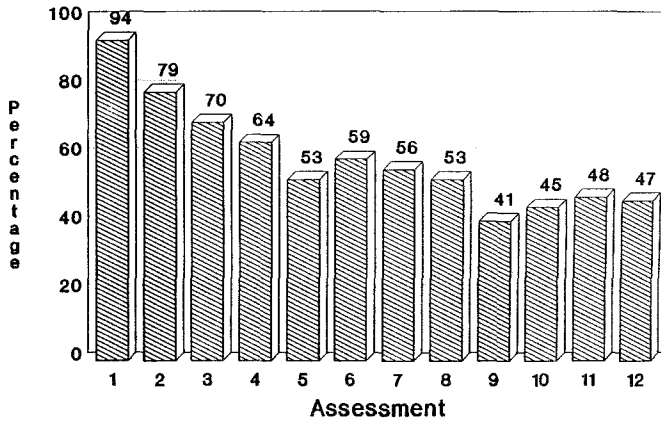


Fig. 1. Percentage of victims with PTSD.

(mean 12.64 days since assault), 94% of the women met symptomatic criteria for PTSD. By Assessment 4 (mean 35.07 days since assault) when the DSM-III-R duration criterion was met, the incidence of PTSD dropped to 65% and by Assessment 12 (mean 94.33 days since assault), to 47%. The incidence was relatively stable from Assessments 5 through 12.

### Patterns of PTSD in Victims with and without Persistent PTSD

Frequency of PTSD symptoms and severity of pathology were calculated separately for victims who met criteria for PTSD at Assessment 12 and those who did not. These data are described below.

Due to the large number of assessments relative to sample size, only data from three assessments were analyzed. Assessments 1 and 12 were selected as the obvious endpoints. Assessment 4 was selected as the point in which women who exhibited PTSD symptoms would meet the DSM-III-R duration criterion for the disorder. However, in order to display the pattern of change from one assessment to another, means and standard deviations of all 12 assessments are depicted in Figs. 2 through 7.

#### *Severity of PTSD Symptomatology*

Means and standard deviations of PTSD symptom severity for the two groups at each assessment point are presented in Fig. 2. Data from Assessments 1, 4, and 12 were submitted to a group (PTSD vs. non-PTSD)

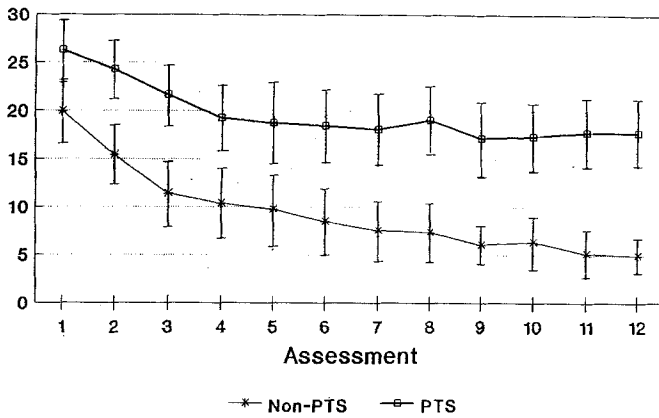


Fig. 2. Severity of PTSD symptoms.

× Assessment (1, 4, 12) ANOVA with assessment as a repeated measure. Significant main effects of group [ $F(1,60) = 56.74, p < 0.001$ ] and of time [ $F(2,120) = 82.19, p < 0.001$ ] were revealed, modified by a significant group × time interaction [ $F(2,120) = 5.70, p < 0.005$ ]. Simple effects analyses indicated that the PTSD group was more severely symptomatic than the non-PTSD group at Assessment 1 [ $F(1,60) = 14.95, p < 0.001$ ], Assessment 4 [ $F(1,60) = 24.14, p < 0.001$ ], and Assessment 12 [ $F(1,60) = 81.54, p < 0.001$ ]. Simple effects of assessment revealed that both the PTSD group [ $F(2,120) = 22.13, p < 0.001$ ], and the non-PTSD group [ $F(2,120) = 68.76, p < 0.001$ ] improved over time.

Because the groups differed at the initial assessment, the data were reanalyzed using an Analysis of Covariance to statistically control initial PTSD symptom severity. Significant main effects of group [ $F(1,55) = 15.38, p < 0.001$ ] and of assessment [ $F(2,112) = 28.26, p < 0.001$ ] were found, but the interaction found previously failed to reach significance [ $F(2,112) = 1.91, p > 0.15$ ]. To further explore the rate of recovery from PTSD, we compared the change scores of each group between Assessment 1 and Assessment 4 and between Assessment 4 and Assessment 12. The examination of change scores between Assessment 1 and Assessment 4 revealed no difference in the rate of change in the two groups [ $F(1,56) = 0.51, p > 0.40$ ]. Similarly, there was no group difference in the rate of change in PTSD severity between Assessment 4 and Assessment 12 [ $F(1,56) = 1.96, p > 0.15$ ].

*Individual Symptoms of PTSD*

Frequencies of individual PTSD symptoms were calculated separately for the PTSD and non-PTSD groups and are presented in Table III. The data were submitted to chi-square analyses. At Assessment 1, no group differences were found on symptoms with the exception of memory/concentration problems [ $\chi^2(1) = 4.86, p < 0.03$ ] and relieving the trauma [ $\chi^2(1) = 7.57, p < 0.01$ ]. Both of these symptoms were reported by more of the women who were diagnosed with PTSD at the last assessment. In contrast, at Assessment 12, a larger percentage of the PTSD group than the non-PTSD group reported nine of the 12 symptoms assessed. The three exceptions were hyperalertness/startle, guilt, and avoidance.

**PTSD-Related Psychopathology in Victims with and Without Persistent PTSD**

Severity of psychopathology in PTSD and non-PTSD women was compared on the following measures: RAST, IES-Intrusion, IES-Avoidance, STAI, and BDI. The means and standard deviations from each of the 12 assessments are depicted in Figs. 3 to 7. An inspection of these figures reveals a consistent pattern. Women who met PTSD diagnosis at the last assessment showed higher initial symptom severity and improved at a slower rate than the women without PTSD. More specifically, both groups improved at similar rates up to Assessment 4 after which the PTSD group showed no further recovery; while the non-PTSD group continued

**Table III.** Percentage of Subjects (Completers) Reporting Symptoms (Weeks 1, 4, and 12)

Symptom	Assessment 1		Assessment 4		Assessment 12	
	PTS (N = 34)	Non-PTS (N = 30)	PTS (N = 34)	Non-PTS (N = 30)	PTS (N = 34)	Non-PTS (N = 30)
Reliving	90.0%	55.9%	63.3%	21.2%	70.0%	8.8%
Nightmares	73.3%	64.7%	73.3%	27.3%	63.3%	11.8%
Flashbacks	90.0%	82.4%	80.0%	42.4%	76.7%	11.8%
Avoidance	96.7%	88.2%	76.7%	78.8%	83.3%	65.6%
Impaired leisure	90.0%	71.6%	83.3%	51.5%	76.6%	17.6%
Detached	87.3%	83.4%	83.3%	42.4%	83.3%	17.6%
Blunted affect	66.7%	71.6%	60.0%	42.4%	43.3%	14.7%
Sleep disturbance	90.0%	91.2%	76.7%	51.5%	73.3%	17.6%
Concentration/memory	96.7%	73.5%	86.7%	57.6%	80.0%	26.5%
Alert/startle	96.7%	97.1%	93.3%	91.9%	86.7%	73.5%
Guilt	66.7%	61.8%	43.3%	17.2%	26.7%	11.8%
Fear	93.3%	73.5%	83.3%	54.5%	90.0%	44.1%

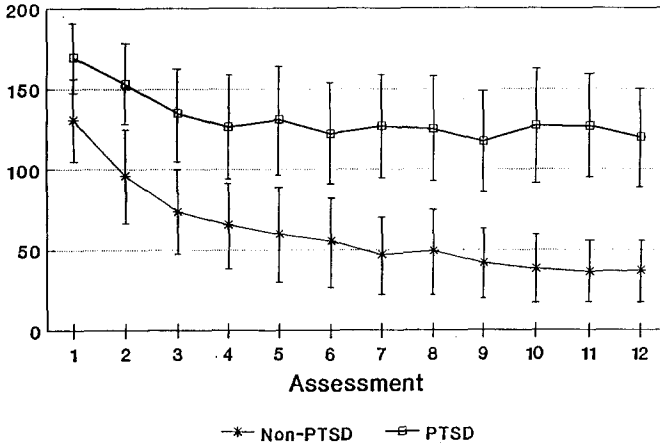


Fig. 3. Rape aftermath symptom test.

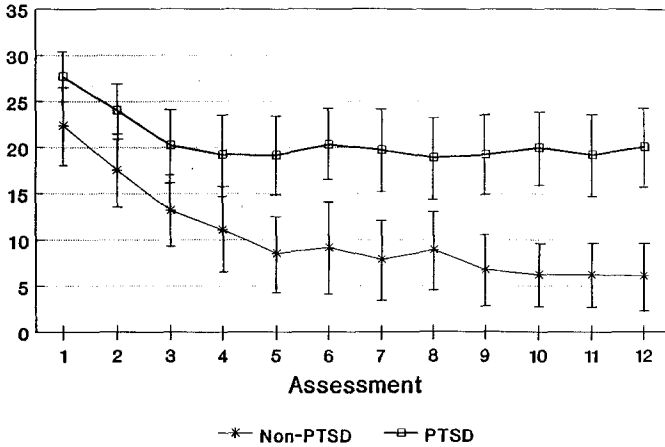


Fig. 4. IES intrusion scale.

to improve. A possible confound arises from the fact that the group of victims who were diagnosed with PTSD at Week 12 also had more severe PTSD symptoms at the initial assessment. To control for this confound, the initial severity scores were partialled out of the related psychopathology measures in the subsequent analyses.

An overall group (PTSD vs. non-PTSD)  $\times$  time (Assessments 1, 4, 12) MANCOVA with assessment as a repeated measure and initial PTSD

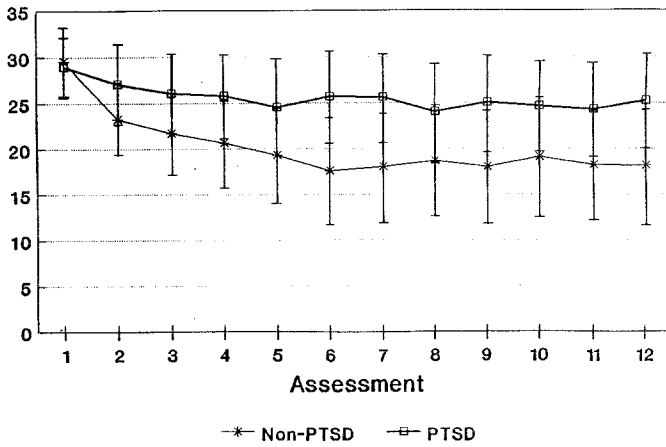


Fig. 5. IES avoidance scale.

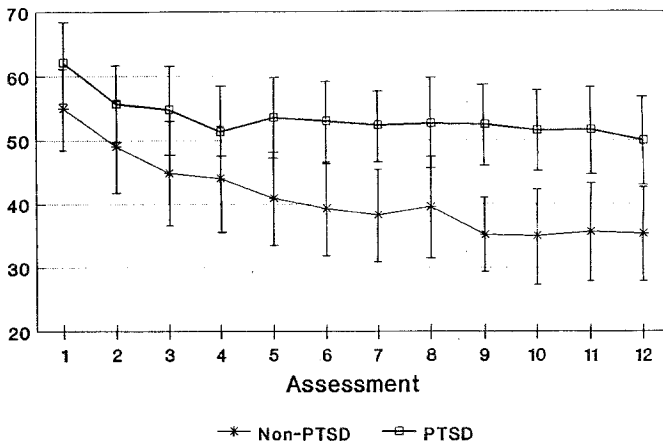


Fig. 6. STAI state scale.

symptom severity as a covariate was conducted using all five scales. Separate  $2 \times 3$  ANCOVAs with assessment as a repeated measure were then conducted for each scale. Finally, simple effects were computed to examine group differences at each of the three assessments and the pattern of change over time for each group. The results of these analyses are presented below. Because subjects sometimes neglected to complete all items

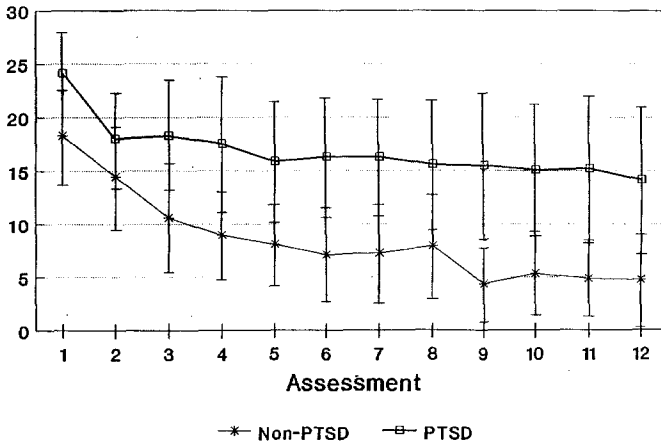


Fig. 7. Beck depression inventory.

of the self-report measures, the degrees of freedom associated with the various analyses differ slightly.

### Overall Group Differences

The overall MANCOVA revealed a significant group  $\times$  time  $\times$  scale interaction [ $F(8,392) = 5.85, p < 0.001$ ]. Results of univariate ANCOVAs conducted on each scale suggested that PTSD victims reported greater severity than non-PTSD victims on four measures: rape-related fear and distress (RAST) [ $F(1,52) = 15.09, p < 0.001$ ]; IES-intrusion [ $F(1,58) = 18.42, p < 0.001$ ]; state anxiety [ $F(1,58) = 6.65, p < 0.02$ ]; and depression [ $F(1,56) = 5.62, p < 0.05$ ]. There was no group difference on the IES-avoidance scale [ $F(1,58) = 2.22, p > 0.14$ ].

Victims showed improvement over time on all five measures: rape-related distress [ $F(2,106) = 61.63, p < 0.001$ ]; intrusion [ $F(2,118) = 55.02, p < 0.001$ ]; avoidance [ $F(2,118) = 12.14, p < 0.001$ ]; state anxiety [ $F(2,118) = 39.58, p < 0.001$ ]; and depression [ $F(2,114) = 43.88, p < 0.001$ ]. These effects were modified by significant group  $\times$  time interactions on rape-related distress [ $F(2,106) = 6.21, p < 0.005$ ], intrusion [ $F(2,118) = 7.08, p < 0.002$ ], and state anxiety [ $F(2,118) = 3.24, p < 0.05$ ]. There were no significant interactions on the avoidance or depression scales. Simple effects for scales which revealed interactions are reported below.

*Group Differences at Assessments 1, 4, and 12*

To examine simple effects of group at each assessment, univariate ANCOVAs were conducted. At Assessment 1, there were no differences between PTSD victims and non-PTSD victims on any of the measures when initial PTSD severity was controlled. At Assessment 4, the PTSD victims were significantly more symptomatic than the non-PTSD victims on the RAST [ $F(1,52) = 8.97, p < 0.005$ ] and IES-intrusion [ $F(1,58) = 5.73, p < 0.05$ ] scales. The groups did not differ significantly on state anxiety [ $F(1,58) = 1.73, p > 0.10$ ]. At Assessment 12, the PTSD victims reported greater rape-related distress [ $F(1,53) = 39.28, p < 0.001$ ], intrusion [ $F(1,59) = 42.41, p < 0.001$ ], and state anxiety [ $F(1,59) = 19.10, p < 0.001$ ] than did victims without PTSD.

*Symptom Patterns Across Assessments 1, 4, and 12 for All Completers*

To examine simple effects of time within group, changes across time were examined separately for the group of who met diagnostic criteria for PTSD at the 12 week assessment and those who did not. Non-PTSD victims showed an overall improvement on rape-related distress [ $F(2,106) = 54.23, p < 0.001$ ], intrusion [ $F(2,118) = 48.55, p < 0.001$ ], and state anxiety [ $F(2,118) = 31.88, p < 0.001$ ]. PTSD victims also showed an overall improvement on rape-related distress [ $F(2,106) = 14.33, p < 0.001$ ], intrusion [ $F(2,118) = 14.12, p < 0.001$ ], and state anxiety [ $F(2,118) = 11.92, p < 0.001$ ]. The interactions described earlier suggest that the groups differ with respect to rate of recovery. This will be examined next.

**Differential Recovery Rate for PTSD and Non-PTSD Victims**

To examine whether the rate of recovery in the PTSD and non-PTSD victims begins to diverge after Assessment 4 as suggested by the means, the groups were compared on the amount of change between Assessments 1 and 4 and the amount of change between Assessments 4 and 12. We explored whether (1) the groups would differ in rate of recovery between Assessments 1 and 4, and (2) the groups would differ in rate of recovery between Assessments 4 and 12. The two groups did not differ in their rate of recovery between Assessments 1 and 4 on any of the psychopathology scales although there was a trend for greater change among the non-PTSD group on the RAST [ $F(1,53) = 3.63, p < 0.10$ ]. The two groups *did* differ in recovery rates between Assessments 4 and 12 on measures of rape-related distress (RAST) [ $F(1,53) = 4.37, p < 0.05$ ], intrusion [ $F(1,59) = 7.51, p < 0.01$ ], and state anxiety [ $F(1,59) = 6.29, p < 0.02$ ]. Post-hoc



comparisons indicated that non-PTSD victims continued to improve on rape-related distress [ $F(1,53) = 19.84, p < 0.001$ ], intrusion [ $F(1,59) = 11.23, p < 0.002$ ], and state anxiety [ $F(1,59) = 16.96, p < 0.001$ ] between Assessment 4 and Assessment 12. No significant symptom reductions were evidenced in the PTSD victims during this period.

### Early Indications of Persistent PTSD

Because the PTSD and non-PTSD groups differed in the severity of their initial psychopathology, we examined which measures at Assessment 1 could best predict the persistence of PTSD symptoms at Assessment 12. To this end, a discriminant function analysis was conducted on all scores. A hierarchical discriminant procedure with inclusion determined by the increase in *Rao's V* produced a significant function [ $\chi^2(2) = 11.27, p < 0.01$ ] based on RAST and IES intrusion scores. This discriminant function correctly classified 72% (21 of 29) of the victims who were diagnosed with PTSD at Assessment 12 and 71% (22 of 31) of those who did not develop PTSD. The overall correct classification of 71.67% represents an improvement of 21.67% over classification based only on the rate of PTSD in the current sample. This reflects a reduction of 19% false positive designations and 22.4% fewer false negative designations than obtained with base-rate classification.

We examined the victims' RAST and IES-intrusion raw scores to develop rules for identifying rape victims likely to develop PTSD. None of the nine victims who scored below 100 on the RAST at Assessment 1 were later diagnosed with PTSD at Assessment 12. Two-thirds (16/24) of the victims with Assessment 1 RAST scores exceeding 160 did show persistent PTSD. For victims with Assessment 1 RAST scores between 100 and 160, classification was based on the IES-intrusion scores. Ten of the 14 victims with intrusion scores above 25 were diagnosed with PTSD at Assessment 12. Of the 13 victims with Assessment 1 intrusion scores of 25 or below, only three developed PTSD at Assessment 12. Using this two-step classification procedure based on the RAST and the IES-intrusion scores, we increased the percentage of correct identification to 89.6 percent (26/29) of the victims who were diagnosed with PTSD at Assessment 12 and 61.3 percent (19/31) of those without PTSD at Assessment 12.

## DISCUSSION

This study prospectively examined the occurrence of PTSD and related symptoms following rape and explored indicators for the disorder. At

the initial assessment (which occurred an average of 12.64 days postassault), almost all victims met PTSD symptom criteria. While the incidence of the disorder decreased over time, approximately one-half of the sample remained post-traumatic stress disordered three to four months after the trauma. These figures are somewhat higher than those reported in retrospective studies (Kilpatrick *et al.*, 1987; Resnick *et al.*, 1989). At a 1-year postassault interview, only 76% of the rape victims (as compared to 94% in our study) reported experiencing sufficient symptoms for a diagnosis of PTSD that lasted less than 1 month (Resnick *et al.*, 1989). More convergence was found with respect to the incidence of PTSD symptoms lasting at least 1 month; both the present study and retrospective data indicate an incidence rate of 60 to 65% of the disorder one month postassault among rape victims.

PTSD incidence, severity, and related psychopathology decreased over the 3 months of the current study for the group as a whole. However, further analyses revealed that some victims recovered and others did not. A clearer picture of the course and severity of PTSD symptoms emerged when pathological responses were examined separately for victims who met PTSD criteria at the end of the study and for those who did not. When first interviewed, victims with persistent PTSD evidenced greater severity of PTSD symptoms than those who recovered. The PTSD victims showed some reduction in symptom severity by the fourth assessment, after which symptoms remained stable and quite severe. In contrast, non-PTSD victims evidenced a rapid decline in symptom severity by the fourth assessment followed by a more gradual but steady recovery throughout the next two months. It seems then that rape victims who do not evidence substantial recovery within 1 month postrape are likely to continue to suffer from PTSD.

Inspection of individual PTSD symptoms revealed that the two groups were similar at the onset of the study. Both showed high frequency of PTSD symptoms. Three months later, however, the frequency of most symptoms was significantly higher for the PTSD group than for the non-PTSD group with three exceptions: hyperalertness/startle, avoidance, and guilt. The frequency of the former two symptoms was quite high for PTSD and non-PTSD groups and guilt was infrequent in both. The high rate of hyperalertness/startle and avoidance symptoms reported by all victims 12 weeks after the assault suggests that anxiety symptoms may persist even after other symptoms of PTSD have reduced.

These results are consistent with those of other studies. Hyperalertness, startle, and avoidance of feared stimuli are manifestations of fear and anxiety rather than dissociation. As noted earlier, intense fear of rape-related situations and general diffuse anxiety are among the most persistent post-rape reactions (for a review see Steketee and Foa, 1987). Veronen

and Kilpatrick (1983), for example, observed that only 23% of victims were asymptomatic at one year post-rape on fear measures. Similarly, Calhoun *et al.* (1982) reported that although victims' fearfulness declined somewhat over time, they remained more fearful than nonvictim controls 1 year post-rape.

Rape victims whose PTSD symptoms persisted through Assessment 12 showed higher rape-related psychopathology throughout the 3-month study than did non-PTSD rape victims. Specifically, they evidenced more severe rape-related distress, trauma-related intrusive thoughts and images, anxiety, and depression at the onset of the study. When initial PTSD severity was partialled out, the two groups were not different in the severity of other psychopathology. This indicates the strong relationship between the different manifestations of psychological disturbance following rape. Even after controlling for initial PTSD severity, the course of recovery remained different for the two groups. Moderate reduction in these symptoms was found by the fourth assessment for both PTSD and non-PTSD groups. Subsequently, all symptoms remained stable and severe in the PTSD group whereas the non-PTSD group continued to improve over the rest of the study. The fact that both interview and questionnaire data converged to present a unified pattern for the course of post-rape psychopathology strongly suggests that between 1 and 2 months after the trauma, persistence of PTSD and related psychopathology can be predicted with a high level of confidence.

Moreover, the current study demonstrates that persistent PTSD in rape victims can be identified in the majority of victims within the first 2 weeks of the assault. Victims' scores on two brief, self-report inventories, the RAST (Kilpatrick, 1988) and the IES-Intrusion (Horowitz *et al.*, 1979) accurately identified over 70% of the victims who later met criteria for PTSD. A two-stage classification strategy correctly identified almost 90% of victims with PTSD at the 12 week assessment and over 60% of victims who did not develop PTSD. These results have important implications for clinical decisions regarding provision of psychological services postrape.

Given the large number of rape victims referred for social services following sexual assault and the ever increasing number of rapes, it is important to identify cost-effective methods for allocating resources. This will involve early identification of predictors for development of chronic PTSD and brief, effective interventions. Effective brief treatment programs have already been developed (Resick *et al.*, 1988; Veronen and Kilpatrick, 1983; Foa *et al.*, 1991) and can be implemented at relatively low cost. The results of the present study suggest that not all rape victims require treatment since one-half of them are expected to recover spontaneously. Our study suggests that rape victims diagnosed with PTSD two months postrape are

unlikely to recover spontaneously. Moreover, PTSD can be detected even earlier by low cost methods. Thus, we have knowledge to assist us in early detection of PTSD and its treatment.

Several points of caution should be recognized. First, the current sample is not representative of all rape victims for two reasons. It is estimated that a relatively small proportion of rapes are reported to the police (Koss *et al.*, 1967). Our primary source for subjects in this study was an emergency room to which rape victims were referred by the police. Also we have included in our study only those who volunteered to participate. It should be noted, however, that a retrospective study of PTSD prevalence among rape victims conducted by Kilpatrick *et al.* (1987) did use a representative sample and their results were quite similar to those reported here. Further, the small sample included in the current study makes it important to replicate these results with an independent sample of rape victims. In addition, subjects in this study were interviewed weekly for three months. It is possible that these interviews may have been therapeutic in themselves, and thus, the extent of recovery found for these subjects may have been greater than the natural course of the disorder.

It is important to note that the study was designed before the completion of the DSM-III-R and therefore not all symptoms of the current diagnostic criteria were assessed. Following other studies that were faced with the same dilemma (Davidson *et al.*, 1992), we constructed diagnostic criteria that closely approximate the current ones. This method yielded results consistent with other studies which used the DSM-III-R diagnostic criteria (Kilpatrick *et al.*, 1987; Resnick *et al.*, 1989).

It is clear that PTSD is a prominent response following rape, although not a universal one. Future studies should examine which traumas are more likely to produce the disorder and which individuals are more likely to develop it. A study investigating these issues is currently under way.

### ACKNOWLEDGMENTS

Preparation of this manuscript was supported by NIMH Grant 5R01MH42178-03. The authors wish to thank Michael J. Kozak for his helpful critique of previous versions of this manuscript.

### REFERENCES

- American Psychiatric Association (1987). *Diagnostic and Statistical Manual of Mental Disorders* (third edition-revised). Washington, D.C.: Author.

- Atkeson, B., Calhoun, K., Resick, P., and Ellis, E. (1982). Victims of rape: Repeated assessment of depressive symptoms. *J. Consult. Clin. Psychol.* 50: 96-102.
- Beck, A. T., and Ward, C. H., Mendelssohn, M., Mock, J., and Erbaugh, J. (1961). An inventory for measuring depression. *Arch. Gen. Psychiatry* 4: 561-571.
- Burgess, A. W., and Holstrom, L. L. (1974). *Rape: Victims of Crisis*, R. J. Brady Company, Bowie, Md., Chapter 3, p. 15.
- Calhoun, K. S., Atkeson, B. M., and Resick, P. A. (1982). A longitudinal examination of fear reactions in victims of rape. *J. Counsel. Psychol.* 29: 655-661.
- Davidson, J., Smith, R., and Kudler, H. (1992). Validity and reliability of the DSM-III criteria for post traumatic stress disorder: Experience with a structured interview. *J. Nerv. Men. Dis.* In press.
- Ellis, E. M., Atkeson, B. M., and Calhoun, K. S. (1981). An assessment of long-term reaction to rape. *J. Abnorm. Psychol.* 90: 263-266.
- Foa, E. B., Rothbaum, B. O., Murdock, T., and Riggs, D. S. (1991). The treatment of PTSD in rape victims. *J. Consult. Clin. Psychol.* 59: 715-723.
- Frank, E., and Stewart, B. D. (1984). Depressive symptoms in rape victims. A revisit. *J. Affect. Dis.* 7: 77-85.
- Frank, E., Turner, S. M., and Duffy, B. (1979). Depressive symptoms in rape victims. *J. Affect. Dis.* 1: 269-277.
- Grinker, R. R., and Spiegel, J. P. (1943). *War Neurosis in North Africa, the Tunisian Campaign, January to May 1943*, Josiah Macy Foundation, New York.
- Horowitz, M. J., Wilner, N., and Alvarez, W. (1979). Impact of event scale: A measure of subjective distress. *Psychosom. Med.* 41: 207-218.
- Kardiner, A. (1941). *The Traumatic Neurosis of War*, Psychosomatic Medicine Monograph II-III, Paul B. Hoeber, New York.
- Kilpatrick, D. G. (1988). Rape aftermath symptom test. In Hersen, M., and Bellack, A. S. (eds.), *Dictionary of Behavioral Assessment Techniques*, Pergamon Press, Oxford.
- Kilpatrick, D. G., Amick, A., and Resnick, H. S. (1988, September). *Preliminary Research Data on Post-traumatic Stress Disorder Following Murders and Drunk Driving Crashes*, Paper presented at the National Organization for Victim Assistance's 14th Annual Meeting, Tucson, Arizona.
- Kilpatrick, D. G., Resick, P. A., and Veronen, L. J. (1981). Effects of a rape experience: A longitudinal study. *J. Social Issues* 37: 105-122.
- Kilpatrick, D. G., Saunders, B. E., Veronen, L. J., Best, C. L., and Von, J. M. (1987). Criminal victimization: Lifetime prevalence, reporting to police, and psychological impact. *Crime Delinq.* 33: 479-489.
- Kilpatrick, D. G., and Veronen, L. J. (1984). *Treatment of Fear and Anxiety in Victims of Rape* (Final Report, Grant R01 MH29602), National Institute of Mental Health, Rockville, Md.
- Kilpatrick, D. G., Veronen, L. J., and Resick, P. A. (1979a). Assessment of the aftermath of rape: Changing patterns of fear. *J. Behav. Assess.* 1: 133-148.
- Kilpatrick, D. G., Veronen, L. J., and Resick, P. A. (1979b). The aftermath of rape: Recent empirical findings. *Am. J. Orthopsychiatry* 49: 658-659.
- Koss, M. P., Gidycz, C. A., and Wisniewski, N. (1987). The scope of rape: Incidence and prevalence of sexual aggression and victimization in a national sample of higher education students. *J. Consult. Clin. Psychol.* 55: 162-170.
- Nadelson, C. C., Notman, M. T., Zackson, H., and Gornick, J. (1982). A follow-up study of rape victims. *Am. J. Psychiatry* 139: 1266-1270.
- Page, H. (1885). *Injuries of the Spine and Spinal Cord Without Apparent Mechanical Lesion*, J. & A. Churchill, London.
- Putnam, J. J. (1881). Recent investigations into patients of so-called concussion of the spine. *Bot. Med. Surg. J.* 109: 217.
- Rado, S. (1942). Pathodynamics and treatment of traumatic war neurosis (traumatophobia). *Psychosom. Med.* 42: 363-368.
- Resick, P. (1987). *Reactions of Female and Male Victims of Rape or Robbery*, Final Report, NIJ Grant MH 37296.

- Resick, P. A., Jordan, C. G., and Girelli, S. A., Hutter, C. K., and Marhoefer-Dvorak, S. (1988). A comparative outcome study of behavioral group therapy for sexual assault victims. *Behav. Ther.* 19: 385-401.
- Resnick, H. S., Veronen, L. J., Saunders, B. E., Kilpatrick, D. G., and Cornelison, V. (1989). *Assessment of PTSD in a Subset of Rape Victims at 12 to 36 Months Post-Assault*, Unpublished manuscript.
- Rigler, R. (1879). *Bever die Folgen der Verletzungen auf Eisenbahnen, insbesondere der Verletzungen des Ruckenmarks. Mit Hinblick auf das Haftpflichtgesetz dargestellt*, VIII, 124, 80, Berlin, Germany.
- Spielberger, C. D. Gorsuch, R. L., and Lushene, R. E. (1970). *Manual for the State-Trait Anxiety Inventory (self-evaluation questionnaire)*, Consulting Psychologists Press, Palo Alto, Calif.
- Steketee, G., and Foa, E. B. (1987). Rape victims: Post-traumatic stress responses and their treatment. *J. Anx. Dis.* 1: 69-86.
- Veronen, L. J. and Kilpatrick, D. G. (1983). Stress management for rape victims. In Meichenbaum, D., and Jaremko, M. E. (eds.), *Stress Reduction and Prevention*, Plenum Press, New York, pp. 341-374.