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Perrin, Sean; Van Hasselt, Vincent; Basilio, Isandy; Hersen, Michel

Published in:
Journal of Traumatic Stress

DOI:
10.1007/BF02104103

1996

Journal of Traumatic Stress, Vol. 9, No. 4, 1996

Assessing the Effects of Violence on Women in Battering Relationships with the Keane MMPI-PTSD Scale

Sean Perrin,[1] Vincent B. Van Hasselt,[1,2] Isandy Basilio,[1] and Michel Hersen[1]

The Minnesota Multiphasic Personality Inventory (MMPI)-Keane Posttraumatic Stress Disorder (PTSD) Scale (PK) has proven to be a reliable and valid measure of PTSD in combat veterans. However, few studies have examined the scale's validity in battered women, who often present with PTSD. Using empirically derived cutoff scores for the PK Scale, 69 battered women were assigned to PTSD-Positive and PTSD-Negative groups and then compared on measures of PTSD, distress, social support, and history of abuse in and out of the battering relationship. The PTSD-Positive group scored significantly higher across all measures of PTSD and distress, supporting the concurrent validity of the PK Scale in this population. However, the two groups differed only for the frequency of death threats, suggesting that the PK Scale is only mildly sensitive to the level of trauma exposure. Finally, lower levels of perceived social support were found in the PTSD-Positive than the PTSD-Negative group. Implications of these findings for the assessment of PTSD in battered women are discussed.

KEY WORDS: assessment; MMPI; PTSD; battered women.

The Minnesota Multiphasic Personality Inventory (MMPI) (Hathaway & McKinley, 1983) is a widely used measure of psychopathology that has proven useful in obtaining diagnostic information from trauma victims (Litz et al., 1991). Of particular interest to trauma researchers is the assessment

[1]Center for Psychological Studies, Nova Southeastern University, 3301 College Avenue, Fort Lauderdale, Florida 33314.
[2]To whom correspondence should be addressed.

0894-9867/96/1000-0805$09.50/1

of posttraumatic stress disorder (PTSD). In this regard, Keane, Malloy, and Fairbank (1984) developed the PK Scale from the MMPI to assess PTSD in combat veterans. The PK Scale consists of 49 items from the MMPI that reliably discriminated between Vietnam veterans with and without PTSD based on a multimethod assessment including a structured diagnostic interview. Specifically, a cutoff score of 30 on the PK Scale correctly classified 82% of Vietnam veterans with PTSD (Keane et al., 1984).

Since the original PK Scale validation study, there have been several cross-validational investigations of this measure in combat veterans (see review by Lyons & Keane, 1992). While more moderate classification rates for PTSD have been found, previous research has shown the PK Scale to be a valid and clinically useful measure of PTSD in combat veterans (Lyons & Keane, 1992; Watson, Juba, Anderson, & Manifold, 1990). To date, only one study has evaluated the validity of the PK Scale against DSM-III-R criteria (APA, 1987) for PTSD in noncombat, trauma victims.

Koretzky and Peck (1990) administered the MMPI and the Structured Clinical Interview for DSM-III-R (SCID) (Spitzer & Williams, 1985) to 69 outpatients who had been victims of violent crime, and car and industrial accidents. A cutoff score of 19 on the PK Scale correctly classified 87% of the validation subjects (n = 24) and 88% of cross-validation subjects (n = 45) with PTSD using diagnoses obtained with the SCID as the standard (Koretzky & Peck, 1990). These findings suggest that the PK Scale is a valid measure of PTSD in crime and accident victims.

Empirical methods for assessing PTSD have been developed in the context of studies involving combat veterans and crime victims (Houskamp & Foy, 1991). Yet, there is a burgeoning body of research indicating that battered women also present with symptoms characteristic of PTSD (e.g., Astin, Lawrence, & Foy, 1993; Dutton, Perrin, Chrestman, & Strauss, 1989; Houskamp & Foy, 1991; Walker, 1985). In the two available studies employing structured interview and DSM-III-R criteria with battered women, 45% of those clinically referred (Houskamp & Foy, 1991) and 84% of those residing in a shelter (Kemp, Rawlings, & Green, 1991) met criteria for PTSD. Despite the apparent prevalence of PTSD in battered women, there is a paucity of studies that have applied the strategies designed to evaluate PTSD in combat veterans and crime victims to victims of domestic violence (Houskamp & Foy, 1991).

Dutton, Perrin, Chrestman, Halle, and Burghardt (1991) examined the concurrent validity of the PK with the Impact of Event Scale (IES, Horowitz et al., 1979), and Crime-Related PTSD Subscale (CR-PTSD, Saunders, Arata, & Kilpatrick, 1990). The IES is a widely used self-report

measure designed to assess the cardinal symptoms of PTSD: intrusion and avoidance of trauma-related stimuli. The CR-PTSD Scale is an empirically derived subscale of the Symptom Checklist-90-Revised (Derogatis, 1977) that was found to correctly classify 89% of crime victims with PTSD (Saunders et al., 1990). Dutton et al. (1991) obtained significant correlations between the PK and CR-PTSD Scales (r = .65), and the Intrusion (r = .33) and Avoidance (r = .41) subscales of the IES in a large sample of battered women (n = 106). Also, significant differences on the PK Scale were observed for PTSD and non-PTSD groups based on the CR-PTSD cutoff score. While this study suggests that the PK Scale is highly correlated with alternative measures of PTSD (i.e., the CR-PTSD and IES Scales), cutoff scores for PTSD were not evaluated. Given the widespread use and ease of administration of the MMPI in clinical settings, establishing the validity of the PK Scale as a measure of PTSD may assist in efforts to identify and treat battered women with PTSD.

The purpose of the present study was to further examine the concurrent validity of the PK Scale as a measure of PTSD in a sample of clinically referred battered women. Using the Koretzky and Peck (1990) recommended cutoff score of 19, battered women were assigned to PTSD-Positive and PTSD-Negative groups and compared on alternative measures of PTSD (i.e., the IES and CR-PTSD), trauma-related fears, and psychological distress. While the cutoff score for PTSD used in this study was much lower than that recommended by Keane et al. (1984), it is consistent with previous validation studies differentiating veterans with PTSD from non-PTSD psychiatric patients (14.5) and from normal controls (17) (Watson, Kucala, & Manifold, 1986) with the PK. Given previous findings for battered women (Dutton, Perrin, Chrestman, & Strauss, 1989; Dutton, Perrin, Chrestman, Halle, & Burghardt, 1991), it was anticipated that the battered women in the PTSD-Positive group would score significantly higher across alternative measures of PTSD, trauma-related fears, and psychological distress than the PTSD-Negative group.

Also, results of previous investigations suggested that characteristics of the victim and the trauma may be related to the development of PTSD in battered women and crime victims (Dutton, Perrin, Chrestman, & Strauss, 1989; Dutton, Perrin, Chrestman, Halle, & Burghardt, 1991; Kilpatrick, Saunders, Amick, Best, & Veronen, 1989). To test this hypothesis, the PTSD-Positive and PTSD-Negative groups were compared on indices of socioeconomic status, history of physical and sexual abuse (in and out of the current battering relationship), and perceived social support.

Method

Subjects

Subjects included 69 women who were clinically referred to the Interpersonal Violence Program (IVP) at Nova Southeastern University, Fort Lauderdale, Florida. IVP is an outpatient clinic specializing in the assessment and treatment of male batterers and victims. Subjects ranged in age from 17 to 57 years at intake (M = 32.9, SD = 8.9). The majority were Caucasian (73%), high school graduates (86%), unemployed (78%), and reported a family income of ≤$10,000 per year (66%). Roughly two thirds were divorced, single, or widowed (65%) with the remainder being married to their current battering partner (35%). Most subjects were not residing with their partners at the time of intake (65%). Finally, 8 of the 69 women in the study (12%) were court-ordered to treatment as part of a probationary or parole agreement or as ordered by the State of Florida Department of Health and Human Services.

Measures

MMPI and PK Scale. All subjects completed the 566-item, form R version of the MMPI (Hawthorne & Hathaway, 1957) including the PK Scale. The MMPI-PK Scale consists of 49 items chosen because they reliably discriminated patients with PTSD from psychiatric controls in a Vietnam, combat veteran population (Keane et al., 1984). Total scores on the PK Scale range from 0 to 49 with higher scores being associated with greater PTSD symptomatology. Both the MMPI and PK Scale have been shown to possess excellent reliability and internal consistency (Keane et al., 1984).

Symptom Checklist-90-Revised (SCL-90-R). The SCL-90-R (Derogatis, 1977) is a 90-item self-report measure of symptomatology and distress. Responses reflect the amount of disturbance a particular item produced during the past week and range from 0 = "Not at All" to 5 = "Extremely." Nine clinical scales (Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism) and three global measures of distress (Global Severity Index, Positive Symptom Index, Positive Symptom Total) are obtained. As mentioned previously, Saunders et al. (1990) developed a 28-item PTSD Subscale for the SCL-90-R that reliably discriminated crime victims with and without PTSD (CR-PTSD: Saunders et al., 1990). Scores also were obtained for this subscale. Higher scores on all scales reflect greater symptomatology. Adequate reliability and internal consistency coefficients have been reported for the SCL-90-R (Derogatis, 1977).

Impact of Event Scale (IES). The IES (Horowitz et al., 1977; Zilberg, Weiss, & Horowitz) is a 15-item measure assessing the frequency of attempts to avoid thoughts/situations related to a traumatic event and intrusive thoughts about that event. Seven items assess avoidance and eight items evaluate intrusion over the past seven days. The frequencies of individual symptoms are scored on a four-point scale (0 = "Not at All;" 1 = "Rarely;" 3 = "Sometimes;" 5 = "Often"). Scores are calculated for the full scale and the Avoidance and Intrusion subscales. The IES has proven to be both a reliable and valid measure of intrusion and avoidance symptoms (Horowitz et al., 1979).

Veronen-Kilpatrick Modified Fear Survey (VK-MFS). The VK-MFS (Veronen & Kilpatrick, 1980) is a 120-item inventory of potentially fear-producing stimuli and situations originally developed to assess fearfulness in rape victims. The intensity of fear is measured on a 5-point scale (1 = "Not at All" to 5 = "Very Much"). The measure is composed of a total fear score and seven fear subscales including: animal, classical, social-interpersonal, tissue damage, miscellaneous, failure/loss of self-esteem, and rape-related fears. Reliability and validity have been established for the VK-MFS (Kilpatrick et al., 1985).

Interpersonal Support Evaluation List (ISEL). The ISEL (Cohen, Mermelstein, Kamarck, & Hoberman, 1985) is a widely used, 40-item questionnaire designed to assess the perceived availability of potential social resources. Four 10-item subscales measure the perceived availability of material aid (Tangible), someone to talk to about problems (Appraisal), positive comparisons (Self-esteem), and people to do things with (Belonging). Items are endorsed as either True or False and summed to yield a total and subscale scores. Higher scores indicate greater perceived social support. Cohen et al. reported moderate to high internal consistency and test-retest coefficients for the ISEL.

Structured Clinical Interview for Domestic Violence (SCIDV). The SCIDV was adapted from the Conflict Tactics Scale (Strauss, 1979) by Douglas (1986) to comprehensively assess the occurrence of specific violent incidents, psychological abuse, injuries, and responses to abuse in the current relationship, previous battering relationships, and family of origin. Sociodemographic characteristics and previous treatment history data are also obtained.

Design and Procedure

All self-report measures were completed as part of a standardized assessment protocol prior to intake. Following completion of the self-report instruments, subjects were interviewed with the SCIDV by a doctoral candidate in clinical psychology trained in the administration of the SCIDV. Inclusion

Table 1. Sociodemographic Characteristics

	PTSD+ (n = 48)	PTSD− (n = 21)	Statistic
Mean age (*SD*)	33.9 (8.7)	30.9 (9.2)	$t(60) = -1.2$
Race (% non-White)	22.0	50.0	$\chi^2(1) = 4.9^a$
Marital status (%)			$\chi^2(2) = 0.4$
Married	38.1	30.0	
Divorced	50.0	55.0	
Single	11.9	15.0	
Living arrangement with partner (%)			$\chi^2(2) = 0.5$
Cohabiting	33.3	40.0	
Temporary apart	7.1	10.0	
Permanently apart	59.1	50.0	
Education (%)			$\chi^2(2) = 5.0$
< HS diploma	9.5	30.0	
HS graduate	52.4	45.0	
≥ College degree	38.1	25.0	
Employed (%)	35.5	25.0	$\chi^2(1) = 0.5$
Family income ($) (%)			$\chi^2(2) = 7.6^b$
0-20,000	76.2	75.0	
21-35,000	23.8	10.0	
> 35,000	0.0	15.0	
Previous Tx history (%)	77.4	68.8	$\chi^2(1) = 0.4$

[a] $p = .03$.
[b] $p = .02$.

criteria for the study were: (1) completion of the MMPI, and (2) the occurrence of at least one violent incident by the current partner. Total scores for the 49-item PK-scale were calculated; subjects were assigned to PTSD-Positive (N = 48) and PTSD-Negative (N = 21) groups using the cutoff score of ≥ 19 recommended by Koretzky and Peck (1990). Group comparisons for categorical and continuous dependent variables were conducted using 2×2 chi-squares and one-tailed t-tests, respectively.

Results

The sociodemographic characteristics of the two groups are presented in Table 1. Few significant differences were found between the two groups, suggesting that most victim characteristics were not related to PK scores. However, subjects in the PTSD-Positive group were more likely to be Caucasian and less likely to report an income above $35,000 per year than the PTSD-Negative group.

Table 2. Means and Standard Deviations for the IES, SCL-90-R, VK-MFS, and ISEL

	PTSD+ (n = 48)		PTSD− (n = 21)		Statistic	
	M	*SD*	*M*	*SD*	*t*	(*df*)
IES						
Total score	48.1	15.1	21.4	19.9	5.8	(60)[a]
Avoidance subscale	24.4	8.6	11.4	9.9	5.2	(59)[a]
Intrusion subscale	23.8	9.2	10.1	11.2	5.1	(60)[a]
SCL-90-R						
Global Symptom Index	1.8	0.7	0.5	0.5	8.2	(59)[a]
PTSD	51.5	19.4	12.7	14.1	8.1	(59)[a]
Dissociation	6.2	4.1	1.1	1.4	7.1	(59)[a]
Paranoia	11.1	5.4	3.7	4.3	5.4	(59)[a]
Interpersonal sensitivity	16.1	7.5	4.3	4.9	6.5	(59)[a]
Anxiety	19.2	9.0	4.9	5.6	7.5	(59)[a]
Phobia	7.8	6.5	1.3	2.1	5.8	(59)[a]
Hostility	10.1	5.8	2.5	3.3	5.6	(59)[a]
Depression	33.2	11.2	9.8	9.3	8.2	(59)[a]
VK-MFS						
Total Fear Score	298.0	71.1	213.0	72.9	4.4	(62)[a]
Rape-related fears	111.6	29.1	80.0	29.3	4.1	(62)[a]
Tissue damage fears	48.4	14.5	35.9	13.3	3.3	(62)[b]
Weapon fears	8.9	2.6	7.7	3.8	1.5	(61)
Vulnerability fears	28.9	8.8	20.9	7.1	3.6	(62)[c]
ISEL						
Total score	21.2	8.4	29.9	7.5	−4.0	(60)[a]
Appraisal	5.1	2.6	7.6	1.8	−3.9	(60)[a]
Self-Esteem	4.7	2.5	7.4	2.2	−4.2	(58)[a]
Belonging	4.9	3.1	7.1	3.1	−2.7	(60)[d]
Tangible	6.5	2.9	7.8	2.9	−1.7	(60)[a]

[a] $p < .0001$.
[b] $p = .001$.
[c] $p = .0005$.
[d] $p = .005$.

Table 2 presents the means and standard deviations for the IES, and selected subscales of the SCL-90-R, MFS, and ISEL. Consistent with our hypothesis, battered women in the PTSD-Positive group scored significantly higher on the three primary measures of PTSD: IES-Intrusion and Avoidance subscales, and the SCL-90-R CR-PTSD Subscale. Mean Intrusion and Avoidance scores were more than double those observed in the PTSD-Negative group, while CR-PTSD scores were four times as great as non-PTSD battered women. Further, battered women scored significantly higher across all SCL-90-R and MFS subscales. The one exception was the Weapons Fears Subscale of the MFS on which the two groups did not differ. Also, the PTSD-Positive groups reported significantly less social support than their PTSD-Negative counterparts on the four ISEL subscales.

Table 3. Characteristics of Current Battering Relationship and Previous Abuse History

	PTSD+ (n = 48)	PTSD− (n = 21)	Statistic
Frequency of Violence (%)			$\chi^2(1) = 3.2^a$
1-10 times	81.3	100.0	
> 10 times	18.8	0.0	
Types of violence/abuse (%)			
Threatens to kill	80.6	50.0	$\chi^2(1) = 4.7^b$
Partner used weapon	41.7	28.6	$\chi^2(1) = 1.1$
Sexual abuse by partner	40.0	12.5	$\chi^2(1) = 4.9^c$
Sustained injury	93.8	81.3	$\chi^2(1) = 1.8$
Required medical Tx	40.6	25.0	$\chi^2(1) = 1.2$
Responses to violence (%)			
Separated	83.9	68.8	$\chi^2(1) = 1.4$
Stayed in shelter	41.9	35.7	$\chi^2(1) = 0.2$
Police involvement	60.4	52.4	$\chi^2(1) = 0.4$
Previous abuse history (%)			
Prior battering relationship	19.4	20.0	$\chi^2(1) = 0.1$
Raped as adult	26.7	12.5	$\chi^2(1) = 1.2$
Molested as child	50.0	37.5	$\chi^2(1) = 0.7$
Physically abused as child	41.9	50.0	$\chi^2(1) = 0.3$

$^a p < .08$.
$^b p < .03$.
$^c p < .06$.

Violence and abuse histories of subjects are presented in Table 3. Again, few significant differences were observed between the two groups, although the pattern of findings was in the expected direction. Specifically, women in the PTSD-Positive group were significantly more likely to report verbal threats on their life by their battering partner than those in the PTSD-Negative group. A trend toward statistical significance was observed for sexual abuse by partner and frequency of violent incidents in the current relationship.

Discussion

The present investigation provides preliminary support for the concurrent validity of the PK as a measure of PTSD in battered women. In

particular, battered women with PTSD as measured by the PK, reported a higher frequency of symptoms of intrusion and avoidance of trauma-related stimuli on the IES and distress upon exposure to trauma-related cues on the MFS (the hallmark symptoms of PTSD). Also, the PTSD-Positive group received higher mean scores on a measure empirically derived to differentiate crime victims with and without PTSD (CR-PTSD Scale). Moreover, a *post-hoc* analysis revealed that the PK cut-off score of 19 correctly classified 83% of the subjects with PTSD and 86% of the subjects without PTSD using the .89 cutoff score for the CR-PTSD Scale as the standard. Finally, subjects in the PTSD-Positive group scored significantly higher across subscales of the SCL-90-R, which tap the secondary and associated symptoms of PTSD including: hypervigilance (Paranoia and Interpersonal Sensitivity scales), hyperautonomic arousal (Anxiety Scale), and depression.

There is considerable content overlap among items assessing PTSD on the VK-MFS, SCL-90-R, and to a lesser extent the IES. However, little if no overlap exists between items on the PK and these alternative measures of PTSD. This is not surprising given the way in which the MMPI was originally constructed and the empirical selection of items for the PK Scale. The low face validity of PK items with respect to PTSD adds to its clinical utility in assessing PTSD.

A second focus of this study was to evaluate the relationship between characteristics of the victim and the trauma, and PTSD. Contrary to previous research with battered women and crime victims (Dutton et al., 1990; Kilpatrick et al., 1990), significant differences for race were observed between the PTSD groups. Eighty eight percent of the women in the PTSD-Positive group were Caucasian compared to only 50% for the PTSD-Negative group. While these findings may be peculiar to this sample of treatment-seeking battered women, it is possible that battered women of color are less likely to report symptoms of PTSD or even to seek treatment for this disorder. Alternatively, they may be more likely to seek treatment with less severe symptoms and that may lessen the occurrence of full-blown PTSD in this group. Clearly, additional investigations including both referred and nonreferred samples of battered women are needed to more fully evaluate the risk for PTSD in Caucasian and minority battered women.

Fewer battered women with PTSD had family incomes above $35,000 than did those without PTSD. This finding suggests that the availability of financial resources may serve as a mediating factor in the development of PTSD. However, it should be noted that more than two thirds of the subjects in both the PTSD-Positive and Negative groups reported annual incomes of less than $25,000. Still, an apparent relationship between coping

resources and PTSD was evident in this study. Specifically, battered women with PTSD reported significantly less perceived social support (ISEL) than those without PTSD. This finding is consistent with those of a previous study by Dutton et al. (1991) who found ISEL scores to account for 71% of the total variance in PK scores.

With regard to the characteristics of the violence experienced by the battered women in this sample, subjects in the PTSD-Positive group tended to report a higher frequency of battering incidents by their partner and more severe types of abuse than those in the PTSD-Negative group. However, only death threats by the battering partner statistically differentiated the two conditions. That is, almost all of the battered women in the PTSD-Positive group reported death threats by their partner compared to only half of those in the PTSD-Negative group. Kilpatrick et al. (1990) observed a similar pattern of findings for crime victims with and without PTSD. It is possible that the frequency of such death threats is a more accurate indicator of the severity of the woman's battering experience or trauma exposure than the actual number of violent incidents. Alternatively, a battered woman's belief that she may be killed by her partner may play an important role in the development of PTSD. This hypothesis is consistent with previous studies that have found the victim's subjective experience of the trauma to be related to the level of posttraumatic symptomatology (Dutton et al., 1994; Gidycz & Koss, 1991; Kilpatrick et al., 1985).

No differences were found between the two groups for the occurrence of abuse prior to the current battering relationship (i.e., a previous battering relationship, adult rape, and sexual and physical abuse as a child). Consistent with previous investigations (Watson et al., 1990), these findings suggest the scores on the PK Scale may only be weakly related to the overall level of trauma exposure. However, the present findings should not be interpreted as evidence of no relationship between prior abuse and PTSD symptomatology in battered women. Indeed, previous studies have found childhood sexual abuse, for example, to be positively correlated with PK scores in battered women (Dutton et al., 1989; Halle, Burghardt, Dutton, & Perrin, 1991). Whether a previous history of abuse increases a battered woman's risk for developing PTSD needs to be evaluated in larger samples using multiple indices of PTSD.

In summary, the present investigation provided preliminary support for the validity of the MMPI PK Scale as a screening measure for PTSD in battered women. Approximately 70% of the battered women were assigned a diagnosis of PTSD based on an empirically-derived cutoff score for the PK Scale. This rate falls within the range for PTSD in battered women reported in two previous investigations using DSM-III-R criteria

(45–84%; Houskamp & Foy, 1991; Kemp et al., 1991). Given the debilitating nature of PTSD and its associated features, rapid identification and treatment of PTSD may play an important role in efforts to increase the battered woman's safety. However, the PK should be considered as only one component of a multimethod assessment of PTSD. Accurate diagnosis of this disorder requires use of DSM criteria, behavioral observation, and physiological data, in addition to self-report measures (Litz et al., 1991). Also, PTSD should be viewed as only one of many possible outcomes of domestic violence (Dutton et al., 1994). As was evident in the present study, battered women who did not meet criteria for PTSD based on their PK scores reported similar levels of violence and abuse as those with PTSD. A comprehensive diagnostic assessment may have revealed other Axis I disorders in the PTSD-Negative group.

Finally, the present findings must be interpreted in light of the methodological limitations of this study. First, our results are based on a sample of clinically referred battered women and may not generalize to battered women who reside in the community or shelters. Second, the PTSD cutoff score used in this study was validated in a sample of crime victims and car/industrial accidents, and thus may not have been sensitive to the true rate of PTSD in this sample of battered women. Third, a nonbattered, psychopathological control group was not included in this study; thus we were unable to ascertain if the present findings were specific to battered women only. Fourth, the measurement of PTSD in this sample was based entirely on self-report measures and not on DSM criteria. Validation of the PK scale against DSM criteria may have revealed a different pattern of findings. Cross-validation studies with battered women using structured diagnostic interviews and DSM-IV criteria for PTSD, as well as the MMPI-2 PK Scale, are needed in future studies with this population. Fifth, a large number of comparisons were conducted in this study which increased the likelihood of Type-1 errors. However, the majority of comparisons performed for the alternative measures of PTSD were significant at $p < .0001$.

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