PERGAMON

Personality and Individual Differences 36 (2004) 1257–1264

PERSONALITY AND INDIVIDUAL DIFFERENCES

www.elsevier.com/locate/paid

Posttraumatic symptoms and suicide risk☆

Yoram Ben-Ya'acov[a,*], Marianne Amir[b,✠]

[a]*Department of Behavioral Sciences, Ben-Gurion University of the Negev, PO Box 653, Beer-Sheva, Israel*
[b]*Department of Social Work, Ben-Gurion University of the Negev, PO Box 653, Beer-Sheva, Israel*

Received 17 June 2002; received in revised form 14 October 2002; accepted 12 December 2002

Abstract

The relationship between traumatic events and suicide risk is well known. Most researches agree that Posttraumatic Stress Disorder (PTSD) plays a major role in this link. However, less is known about the specific posttraumatic symptom constellation that predicts suicide risk. In the current study we examined the posttraumatic symptom's profile which is associated with suicide risk, in a community sample of men with no known psychopathology. The research population included 103 men aged 25–45. They were administered the 'Traumatic Event Questionnaire', 'PTSD Scale', 'Suicide Risk Scale' (SRS) and the SCL-90. Results indicated that suicide risk was predicted by high levels of depression and hostility. High levels of arousal symptom and low levels of avoidance added a significant contribution to that prediction, suggesting that avoidance may serve as a buffer against suicide risk, while high levels of arousal may increase suicide risk. These findings may serve mental health professionals to identify high-risk persons also in a non-clinical population.

Keywords: Posttraumatic symptoms; Suicide risk; Depression; Hostility

A considerable body of research has indicated a relationship between Posttraumatic Stress Disorder (PTSD) and the risk of suicide among survivors of a variety of traumatic events such as combat trauma (Hendin & Haas, 1991), battered women (Sharhabani-Arzy, Amir, & Ben-Ya'acov, 2002), sexual abuse (Zlotnick, Mattia, & Zimmerman, 2001) and rape (Bridgeland, Duane, & Stewart, 2001).

This relationship has been observed in studies of completed suicide, attempted suicide and suicide ideation among Vietnam veterans (e.g. Davidson & Foa, 1993; Hendin & Haas, 1984; Kramer, Lindy, Green, Grace, & Leonard, 1994). The clinical literature describes traumatized

☆ This paper is in memorial to my Ph.D. supervisor Professor Marianne Amir who passed away in January 2004.

* Corresponding author. Tel.: +972-86519884; fax: +972-86519884.
E-mail address: yoramb@bgumail.bgu.ac.il (Y. Ben-Ya'acov).

0191-8869/03/$ - see front matter
doi:10.1016/S0191-8869(03)00003-5

individuals' persistent preoccupation with suicide, indicated that it is not just PTSD which leads to suicide, but also the intense guilt feelings (Hendin & Haas, 1991), depression (Freeman & Moore, 2000) among other psychological symptoms often underlying the suicide attempts.

While a wide consensus prevails regarding the existence of a relationship between PTSD and suicide risk, relatively less is known about the unique contribution of specific posttraumatic symptoms in predicting suicide risk. Research carried out by Amir, Kaplan, Efroni, and Kotler (1999), examining this issue suggests that high scores on certain configuration of posttraumatic symptoms may play a significant role in the prediction of suicide risk. They found that suicide risk was predicted by high levels of intrusion in a sample of posttraumatic patients. In another study, Kotler, Iancu, Efroni, and Amir (2001) revealed a positive association between suicide risk and impulsivity among posttraumatic patients, which like arousal, is related to the regulation of affect. PTSD symptoms of intrusion and avoidance were only mildly positively correlated with suicide risk. More recently, Sharhabani-Arzy et al. (2002) found that among battered women there was a significant association between high levels of arousal and suicide risk.

It should be noticed that most studies investigating suicide risk and posttraumatic symptoms have dealt with pathological groups diagnosed as suffering from PTSD (e.g. Kotler et al., 2001). Whether the relationship between specific posttraumatic symptom's pattern and suicide risk is also characteristic of non-pathological populations is a question that remains to be examined. This question is of importance since it may serve mental health professionals to identify high-risk persons also in a population with no known psychopathology. Supporting the latter possibility are findings indicating that posttraumatic symptoms are evident in numerous normal populations (e.g. Amir & Sol, 1999). Moreover, suicide risk is typically conceptualized as a continuum ranging from suicidal behavior (thoughts, ideation and attempts) to actual suicide, with a variance of scores even in normal populations (Plutchik & Van Praag, 1990). For this reason, an association between these two sets of variables might be expected among non-clinical groups. Evidence in this direction would have not only theoretical importance, but practical implications in terms of the identification of at-risk individuals exposed to traumatic events.

In light of this possibility, the present study sought to examine the predictive role of posttraumatic symptoms to suicide risk in a community sample of men with no known pathology. Based on earlier studies (e.g. Amir et al., 1999; Kotler et al., 2001; Sharhabani-Arzy et al., 2002) we hypothesized that high levels of arousal would predict higher levels of suicide risk, beyond the contribution of psychological symptoms such as depression, anxiety and hostility.

1. Method

1.1. Participants

The sample population comprised 103 men aged 25–45 years (mean age 34.6, S.D. = 6.16). The sample was recruited from a large outpatient clinic in a major medical center in the south of Israel. The clinic is visited by people consulting physicians from almost all branches of medicine. Most participants had minor medical problems. On the basis of a background questionnaire, this population was found to be highly representative of the general Israeli population, as defined by the Central Bureau of Statistics (1998).

1.2. Instruments

1.2.1. Background questionnaire

A self-report questionnaire was administered in which participants provided demographic information regarding age, marital status, and education.

1.2.2. The traumatic event questionnaire

This self-report questionnaire was designed for the purposes of the present study on the basis of other questionnaires examining the prevalence of traumatic events in non-clinical samples (e.g. Amir & Sol, 1999; Norris, 1992). The questionnaire included 10 questions, tailored to Israeli reality, concerning exposure to specific traumatic events. The participants were asked to affirm whether or not they had personally experienced a certain traumatic event. Participants could report exposure to more than one traumatic event. Twenty-three people did not report exposure to any event and were excluded from the study.

1.2.3. PTSD Scale

The PTSD inventory used was a self-report scale based on DSM-III-R criteria (APA, 1987), adapted from Horowitz, Wilner, and Kaltreider (1980). The scale consists of 17 items that correspond to the 17 PTSD symptoms outlined in the DSM III-R. Respondents were asked to indicate whether or not they had experienced the symptom delineated in each statement during the last month. In the present study, the intensity of the three main categories of PTSD symptoms: intrusion, avoidance and arousal were examined. Cronbach's α was 0.92, 0.95 and 0.93 for the three subscales, respectively.

1.2.4. Suicidal Risk Scale (SRS)

This self-report questionnaire consists of 26 items confirmed to be valid discriminators of suicide risk across several populations (Plutchik, Van Praag, & Conte, 1989). The items refer to past history of suicide attempts, strength of suicidal impulses, feelings of depression and hopelessness, and other factors reported to be associated with patients who have made suicide attempts. In the present study, Cronbach's α was 0.96.

1.2.5. SCL-90

The SCL-90 is a self-report measure that assesses psychiatric symptoms during the 2 weeks preceding the assessment. This scale provides a measure of the severity of general psychiatric symptomatology (Derogatis, 1977). The SCL-90 is divided into nine subscales. In the present study, we used three sub-scales of the SCL-90: depression, anxiety and hostility. Cronbach's α for the three subscales in this study was 0.94, 0.95 and 0.93, respectively.

1.3. Procedure

People waiting to see the physician in an outpatient specialist clinic were approached and asked to participate in a study examining exposure to traumatic events. The clinic serves almost all branches of medicine and most patients have minor physical problems. Participation was voluntary and all participants expressed consent. The ethics committee of the Ben-Gurion University of

the Negev approved this study. Initially, respondents were asked to fill out the Traumatic Event Questionnaire. If the results indicated that the respondent has experienced at least one traumatic event, the PTSD Scale, the SRS and the SCL-90 were administered.

2. Results

Two sets of analyses were carried out. In the first set, Pearson correlations were carried out examining the relationships between the demographic variables, psychological symptoms, PTSD symptoms and suicidal risk. In the second set, a hierarchical multiple regression analysis was conducted in order to determine the extent to which each category of independent variables contributed to the prediction of suicidal risk.

The results of the correlational analysis (Table 1) indicated that suicide risk was positively correlated with anxiety, depression and hostility as well as with the intensity of all three post-traumatic symptoms, intrusion, avoidance and arousal. Marital status was also positively correlated with suicide risk, in that being alone was associated with a higher suicide risk.

In order to assess the contribution of the demographic variables, psychological symptoms and PTSD symptoms to the prediction of suicidal risk, a hierarchical multiple regression analysis was performed in which demographic variables were entered in the first step, psychological symptoms in the second step, and PTSD symptoms in the third step. As shown in Table 2, the demographic variables explained 11% of the total variance. This variance was attributed to the positive association between being unmarried and suicide risk. Psychological symptoms explained an additional 19% of the total variance. This variance was due to positive associations between

Table 1
Correlations between suicide risk, demographic, psychological, and PTSD variables[a]

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Marital status[b]												
2. Education	0.28**											
3. Age	−0.57**	−0.27**										
4. Years since the traumatic event	0.08	−0.00	−0.03									
5. Number of traumatic events	−0.14	−0.00	−0.05	0.00								
6. Anxiety	−0.01	−0.19	−0.24	0.01	−0.04							
7. Depression	0.25*	−0.05	−0.11	−0.00	−0.10	0.63**						
8. Hostility	−0.00	−0.24	0.09	0.06	−0.01	0.71**	0.45**					
9. Intrusion	−0.02	−0.10	0.10	−0.13	−0.02	0.07	0.04	0.05				
10. Avoidance	0.04	−0.09	0.15	−0.14	0.03	0.15	0.11	0.14	0.91**			
11. Arousal	0.07	−0.11	0.14	−0.09	0.04	0.21*	0.17	0.20*	0.87**	0.93**		
12. Suicide risk	0.27**	−0.08	−0.10	−0.02	−0.12	0.36**	0.46**	0.39**	0.27**	0.24**	0.33**	

[a] $N = 103$.
[b] The variable of marital status was binary and coded as 0 = Single and 1 = Married.
* $P < 0.05$ (two-tailed tests).
** $P < 0.01$ (two-tailed tests).

Table 2
Summary of hierarchical multiple regression analysis for variables predicting suicide risk[a]

Variables	R	R^2	ΔR^2	β	t/F[b]	P
Step 1						
Demographic variables	0.33	0.11	11%		2.36	0.04
Marital status				0.33	2.8	0.005
Education				−0.16	−1.63	0.11
Age				0.04	0.03	0.75
Year since the traumatic event/s				−0.04	−0.43	0.67
Number of traumatic events				−0.07	−0.74	0.46
Step 2						
Psychological symptoms	0.55	0.30	+19%		5.13	0.002
Depression				0.30	2.47	0.001
Anxiety				−0.00	0.04	ns
Hostility				2.25	2.00	0.04
Step 3						
PTSD symptoms	0.63	0.40	+10%		5.14	0.002
Avoidance				−0.68	−2.58	0.01
Intrusion				0.41	1.97	0.052
Arousal				0.51	2.25	0.03

Total F for Step 3: $F(11, 91) = 5.58$, $P < 0.00001$.

[a] $N = 103$ (two-tailed test).

[b] $t = t$ value associated with β. $F = F$ associated with the changes in R^2.

depression and hostility and the risk of suicide. PTSD symptoms were found to contribute another 10% to the explained variance. This variance was derived from the symptoms of arousal and avoidance. Arousal level was positively associated with suicide risk, and avoidance level was negatively associated with suicide risk. It should be noted that the symptom of intrusion was positively associated to suicide risk, and approached significance ($P = 0.052$). The overall model explained 40% of the total variance associated with suicide risk.

3. Discussion

The results of this study revealed that in a community sample of men who had been exposed to traumatic life events, suicide risk was significantly predicted by two posttraumatic symptoms, arousal and avoidance. When arousal levels were higher and avoidance levels lower, the suicide risk was greater. The results further indicated that suicide risk was positively associated with being unmarried, and with having higher levels of depression and feelings of hostility.

The findings of the present study reiterate previous findings showing that being unmarried increases suicide risk. Statistics obtained in the United States indicate that single men have a suicide rate twice that of married men (e.g. Retterstol, 1993). Stack and Wasserman (1993) found that marital integration (nonmarried, divorced, single status) significantly increased the odds of dying from suicide among a national random sample in the USA.

The data indicating a positive association between the psychological symptoms of depression and hostility and suicide risk are likewise consistent with previous findings. A large number of studies have found evidence of a relationship between depression, hostility, anxiety and suicide following exposure to traumatic events (Hopes & Williams, 1999; Iancu, Horesh, Offer, Dannon, Lepkifker, & Kotler, 1999; Ponizovsky & Ritsner, 1999). Other studies investigated the contribution of PTSD symptoms beyond depression, anxiety, etc. For example, Mazza (2000) showed that PTSD symptomatology has a unique relationship to adolescent suicidal behavior that cannot be explained by depression or gender. The present study aimed at exploring the contribution of the specific posttraumatic symptoms beyond psychological symptoms, such as depression and hostility.

Different explanations may account for the central findings of an association between high levels of arousal and suicide risk, and low levels of avoidance and suicide risk. The former finding may be interpreted in terms of problems in impulse control and affect regulation. According to the DSM-III-R (1987), impulsiveness represents the individual's inability to control impulses and wishes, and to postpone immediate gratification in order to achieve long-term goals. This version of the DSM lists impulsiveness as one of the most prominent characteristics of PTSD. Recent research has found that impulsiveness is related to suicide risk among PTSD patients (Kotler et al., 2001), thereby supporting the contention that impulsivity may be a predictor of potential suicide. Much like impulsiveness, the symptom of arousal is related to problems of control and regulation of impulses. According to the DSM-IV (1994) arousal involves symptoms such as stress, agitation, animosity, hypervigilence, sleeping disorders, outbursts and extreme reaction to sudden noises. Thus, the regulation and control of behavior may account for the relevance of both arousal and impulsivity to suicide risk. While additional research is needed to validate this suggestion, the present results suggest that arousal may be a predicting factor.

The finding that low levels of avoidance were associated with higher levels of suicide risk can possibly be explained according to Horowitz's (1986) classic model of human response to trauma, in which avoidance is conceived as a coping strategy. In what he terms, the "stress-response syndrome", people oscillate between two extremes of behavior in order to process the trauma experience. These behavioral extremes are avoidance and intrusion. In this model, avoidance serves to barricade the individual against the deluge of intrusive images and thoughts that are normal and common in traumatic states. Avoidance involves the fortification of the individual's psychological defenses through withdrawal from social activity. This withdrawal serves to rebalance the person's mental state. In this sense, avoidance may act as an adaptive coping mechanism that protects the individual from emotional distress. As such, the degree to which people engage this mechanism possibly reflects their degree of personal resilience. Compatible with this explanation was the present finding that the intrusion aspect of PTSD, while not a significant predictor, was positively associated to suicide risk.

Together, the main findings suggest that the PTSD symptoms of arousal and avoidance may be involved in the prediction of suicide risk. One possibility is that an individual who has difficulty avoiding significant stimuli but is impulsive may react more strongly to memories of the traumatic event/s, and therefore may be more vulnerable to suicide. Another possibility is that an individual who does not engage the defense of avoidance, and therefore is continually subjected to and obsessed with intrusive thoughts, and who also acts impulsively, may be more likely to act on a suicidal impulse. This tendency may be aggravated when the person is more depressed and/

or feeling hostile. Likewise, when the person feels alone and without a social support system (such as a spouse), suicide may be more likely.

4. Conclusion

The present study was limited in that the sample consisted of men only. In addition, it should be kept in mind that the dependent variable here is suicide risk and not suicide behavior. Also, given the low base rate of both suicide and PTSD, in addition to the small sample, the findings should be interpreted as trends. The results of this study have possibly both practical and theoretical implications. At the practical level, they may identify specific risk factors that may predict suicide risk. Moreover, they suggest that it may be important to look at the specific posttraumatic symptom profile when assessing suicide risk. At the theoretical level, they extend previous research on pathological populations to a non-clinical sample, suggesting that the relationship between specific PTSD symptoms and suicide risk may be an important contribution beyond psychological symptoms.

Acknowledgements

We wish to thank Dr. Avi Besser for his invaluable help with the data analysis.

References

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorder* (3rd-R ed.). Washington DC: American Psychiatric Association.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorder* (4th ed.). Washington DC: American Psychiatric Association.

Amir, M., Kaplan, Z., Efroni, R., & Kotler, M. (1999). Suicide risk and coping styles in posttraumatic stress disorder patients. *Psychotherapy and Psychosomatics*, *68*, 76–81.

Amir, M., & Sol, O. (1999). Psychological impact and prevalence of traumatic events in a student sample in Israel: the effect of multiple traumatic events and physical injury. *Journal of Traumatic Stress*, *12*, 139–154.

Bridgeland, W., Duane, E., & Stewart, C. (2001). Victimization and attempted suicide among college students. *College Student Journal*, *35*, 63–76.

Central Bureau of Statistics (1998). *The statistical handbook of Israel* (Vol. 49). Jerusalem, Israel.

Davidson, J. R. T., & Foa, E. B. (1993). *Post traumatic stress disorder: DSM IV and beyond*. Washington, DC: American Psychiatric Press.

Derogatis, L. R. (1977). *The SCL-90 manual F: scoring, administration and procedures of the SCL-90*. Baltimore, MD: John Hopkins University, School of Medicine, Clinical Psychometrics Unit.

Freeman, T. W., & Moore, W. M. (2000). A comparison of chronic combat-related posttraumatic stress disorder (PTSD) patients with and without a history of suicide attempts. *Journal of Nervous and Mental Disease*, *188*, 460–463.

Hendin, H., & Haas, A. P. (1984). *Wounds of war: the psychological aftermath of combat in Vietnam*. New York: Basic Books.

Hendin, H., & Haas, A. P. (1991). Suicide and guilt as manifestations of PTSD in Vietnam combat veterans. *American Journal of Psychiatry*, *148*, 586–591.

Hopes, L., & Williams, A. (1999). Depression, self-defeating and self-destructive behaviors as predictors of suicide ideation in males and females. *Psychological Reports*, *84*, 63–66.

Horowitz, M. (1986). *Stress response syndromes*. Northvale, NJ: Jason Aronson.

Horowitz, M., Wilner, N., & Kaltreider, N. (1980). Signs and symptoms of posttraumatic stress disorder. *Archives of General Psychiatry*, *37*, 85–92.

Iancu, I., Horesh, N., Offer, D., Dannon, P. N., Lepkifker, E., & Kotler, M. (1999). Alexithymia, affect intensity and emotional range in suicidal patients. *Psychotherapy and Psychsomatics*, *68*, 276–280.

Kotler, M., Iancu, I., Efroni, R., & Amir, M. (2001). Anger, impulsivity, social support and suicide risk in patients with posttraumatic stress disorder. *Journal of Nervous and Mental Disease*, *189*, 162–167.

Kramer, T. L., Lindy, J. D., Green, B. L., Grace, M. C., & Leonard, A. C. (1994). The comorbidity of post traumatic stress disorder and suicidality in Vietnam veterans. *Journal of Suicide and Life-Threatening Behavior*, *24*, 58–67.

Mazza, J. (2000). The relationship between posttraumatic stress symptomatology and suicidal behavior in school-based adolescents. *Suicide and Life Threatening Behavior*, *30*, 91–103.

Norris, F. H. (1992). Epidemiology of trauma: frequency and different potentiality traumatic events on different demographic groups. *Journal of Consulting and Clinical Psychology*, *60*, 409–418.

Plutchik, R., & Van-Praag, H. M. (1990). Psychological correlates of suicide and violence risk. In R. Plutchik, H. M. Van-Praag, & A. Apter (Eds.), *Violence and suicidality: perspectives in clinical and psychobiological research*. New-York: Brunner/Mazel.

Plutchik, R., Van Praag, H. M., & Conte, H. R. (1989). Correlates of suicide and violence risk: the suicide risk measure. *Comprehensive Psychiatry*, *30*, 296–302.

Ponizovsky, A. M., & Ritsner, M. S. (1999). *Suicide and life threatening behavior*, *29*, 376–392.

Retterstol, N. (1993). *Suicide: a European perspective*. New York: Cambridge University Press.

Sharhabani-Arzy, R., Amir, M., & Ben-Ya'acov, Y. (2002). Suicide risk, PTSD and personality styles among battered women. *Family Violence and Sexual Assault Bulletin*, *18*, 15–22.

Stack, S., & Wasserman, I. (1993). Marital status, alcohol consumption, and suicide: An analysis of national data. *Journal of Marriage and the Family*, *55*, 1018–1024.

Zlotnick, C., Mattia, J., & Zimmerman, M. (2001). Clinical features of survivors of sexual abuse with major depression. *Child Abuse and Neglect*, *25*, 357–367.