



Self-mutilative behaviours in male alcohol-dependent inpatients and relationship with posttraumatic stress disorder

Cuneyt Evren^{a,*}, Ercan Dalbudak^a, Bilge Evren^b, Rabia Cetin^a, Mine Durkaya^a

^a Bakirkoy State Hospital for Mental Health and Neurological Disorders, Alcohol and Drug Research, Treatment and Training Center (AMATEM), Istanbul, Turkey

^b Department of Psychiatry, Baltalimani State Hospital for Musculoskeletal Disorders, Istanbul, Turkey

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ABSTRACT

The aim of this study was to investigate the relationship between self-mutilation (SM) and posttraumatic stress disorder (PTSD) in male alcohol-dependent inpatients, and to examine whether there is something unique about self-mutilators with the PTSD/alcohol-dependence co-morbidity, compared with self-mutilators without PTSD in this population. Participants were 156 consecutively admitted male alcohol-dependent inpatients. Patients were investigated with the Self-mutilative Behaviour Questionnaire (SMBQ), the Traumatic Experiences Checklist (TEC), the Clinician Administered PTSD Scale (CAPS), the Symptom Checklist-Revised (SCL-90-R) and the Michigan Alcoholism Screening Test (MAST). Among alcohol-dependent inpatients, 34.0% ($n = 53$) were considered as group with SM. Rate of being unemployed, history of any trauma, history of suicide attempt and lifetime PTSD diagnosis were higher, whereas being married, current age, age at onset of regular alcohol use and duration of education were lower in the group with SM. Mean scores of SCL-90 subscales, TEC and MAST were higher in the SM group. Although SM might be related with PTSD among male alcohol-dependent inpatients, predictors of SM were age at onset of regular alcohol use, history of suicide attempt, anxiety, depression and hostility. Age at onset of regular alcohol use, history of suicide attempt, anxiety, depression and somatisation predicted SM in the subgroup of patients without PTSD, whereas hostility predicted SM alone in the subgroup of patients with PTSD. Results support the anti-suicide and the affect-regulation models of SM in the non-PTSD group, whereas they support the hostility model of SM in the subgroup with PTSD in alcohol-dependent inpatients. Thus, to reduce self-mutilative behaviour (SMB) among alcohol-dependent patients, clinicians must address different subjects in different subgroup patients; that is, focussing hostility in those with PTSD co-morbidity.

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1. Introduction

Self-mutilation (SM) might be defined as 'deliberate self-injury to body tissue without the intent to die' (Briere and Gil, 1998; Favazza, 1998; Taiminen et al., 1998; Zlotnick et al., 1999). SM typically starts in adolescence, between ages 14 and 24 years, and involves numerous episodes and a variety of methods (Favazza and Conterio, 1989; Favazza, 1989). Research suggests that the most common form of SM is skin-cutting, occurring in between 70% and 97% of individuals who self-mutilate, followed by banging or hitting (21–44%) and burning (15–35%) (Klonsky, 2007). Self-mutilators report a range of motivations, including affect-regulation, self-punishment, tension reduction, improvement in mood, to terminate the discomfort of dissociative experiences and distraction from intolerable affects, all which might be at least a partial explanation for this act (Herpertz, 1995; Favazza, 1998; Zlotnick et al.,

1999; Klonsky, 2009). Population-based studies suggest that those engaging even in minor SM warrant screening for psychiatric disorder (Skegg et al., 2004). Consistent with this, SM is encountered frequently in inpatient (Favazza, 1989) and outpatient (Suyemoto and MacDonald, 1995) psychiatric settings. These patients may have major depression, anxiety, schizophrenia (Romans et al., 1995; Zlotnick et al., 1999; Haw et al., 2001), dissociative disorder (Briere and Gil, 1998), impulse control disorder (Taiminen et al., 1998), eating disorder (Romans et al., 1995; Farber, 1997), personality disorders (Herpertz et al., 1997), substance abuse (Evans and Lacey, 1992; Langbehn and Pfohl, 1993; Zlotnick et al., 1999; Turell and Armsworth, 2000) and, last but not the least, posttraumatic stress disorder (PTSD) (Sacks et al., 2008).

The rate of SM ranged between 33.0% and 34.6% among treatment-seeking patients with substance dependency (Evren and Evren, 2005, 2006), and ranged between 26.0% and 29.0% among inpatients, who were only dependent to alcohol, in Turkey (Evren and Evren, 2005; Evren et al., 2008). When considering other populations, this rate was found to be between 14% and 35% in college students (Zoroglu et al., 2003; Sacks et al., 2008), approximately 21.4% in adult clinical populations (Klonsky et al., 2003) and 4% in the general population

* Corresponding author. Icadiye Cad. Mentesh Sok., Selcuk Apt. 1/17 Kuzguncuk, 34674 Uskudar, Istanbul, Turkey. Tel.: +90 216 3410609, +90 532 6040946(Mobile); fax: +90 212 6600026.

E-mail addresses: cuneytevren@yahoo.com, cuneytevren@hotmail.com (C. Evren).

(Briere and Gil, 1998). Thus, rates for SM are higher in alcohol-dependent patients than other clinical and general populations. Nevertheless, it is an important issue because self-mutilative behaviours (SMBs) have been linked to negative outcomes, including increased risk for successful suicide (Suominen et al., 2004; Cooper et al., 2005) and significant problems in therapeutic and interpersonal relationships (Favazza, 1998).

There are few studies that evaluated SM among populations with alcohol and substance dependency. Young age (Evren and Evren, 2005), childhood physical abuse (Evren and Evren, 2005, 2006), suicide-attempt history (Evren and Evren, 2005, 2006) and having a personality disorder (Evren et al., 2006) have been proposed as determinants of SM among male subjects with different types of substance dependency. In the study of Oyefeso et al. (2008), both including males and females, it was suggested that the predominant function of SM in a homogeneous group of opiate-dependent patients was affect-regulation and, secondarily, self-punishment. Further, in a recent study among a homogeneous group of male alcohol-dependent inpatients, childhood abuse, younger age, early onset of alcoholism and high probability of suffering from pathological dissociation predicted SM (Evren et al., 2008). It was suggested that SMB can provide useful criteria for subtyping heroin-dependent patients (Pérez de los Cobos et al., 2009). Finally, in a recent study, borderline personality disorder (BPD), alcohol dependence, childhood sexual abuse and multiple suicide attempts were risk factors for SM in opioid-dependent patients (Maloney et al., 2010).

High prevalence rates of PTSD co-morbidity ranging between 36% and 52% have been documented among populations with alcohol abuse (Breslau and Davis, 1992; Kessler et al., 1995). In two recent studies in Turkey, rates of lifetime PTSD diagnosis among alcohol-dependent inpatients ranged between 26.8% and 31.0% (Kural et al., 2004; Evren et al., 2006). Compared with patients with alcohol use solely, those with both alcohol use and PTSD respond to treatment less favourably, relapse faster, take more alcohol during drinking days and experience more heavy drinking days in the post-treatment period (Brown et al., 1995; Ouimette et al., 1998; Brown et al., 1999; Jacobsen et al., 2001; Read et al., 2004). Among inpatients with substance-use disorders, those with histories of distressing traumatic events reported more SM acts than did patients without such histories (Zlotnick et al., 1997). As mentioned before, PTSD patients are one of the highest risk groups for SM (Sacks et al., 2008). Among veterans with PTSD, 54.8% reported engaging in SMB in the previous 2 weeks (Sacks et al., 2008). Rates of lifetime SM history range between 50% and 80% among patients with BPD diagnosis, which is considered to be highly related to SMB (Oumaya et al., 2008). Psychologic trauma can result in SM manifesting in many forms in patients, who have PTSD (Gupta et al., 2005). According to the clinicians from four national organisations in USA, the most common challenges associated with treating patients with co-morbid substance-use disorder and PTSD includes knowing how to best prioritise and integrate treatment components, patient SMB and severe symptomatology, and helping patients abstain from substance use (Back et al., 2009).

Nock and Prinstein (2005) proposed two possible functions of SM: (1) automatic-negative reinforcement, where an individual uses SM to reduce his experience of negative emotional states such as tension, sadness or anxiety; and (2) automatic-positive reinforcement, where an individual engages in SM to create some desired physiological or emotional state. Similarly, alcohol and drug abuse/dependence represent behaviours that are injurious to the self (although less directly than SM) and may be maintained by both of these automatic reinforcements (Koob and Kreek, 2007). Although case reports considering the SMB within PTSD populations have been published 2 decades ago (Lyons, 1991), little is known about SM in PTSD. In each of these case studies, SM appeared to occur within the context of PTSD symptomatology, serving as an automatic-negative reinforcer (Greenspan and Samuel, 1989; Lyons, 1991; Pitman, 1990) suggesting

affect-regulation (coping with feelings) model (Klonsky, 2007, 2009). In contrast with this, examination of habit antecedents and sequelae in a recent study among a sample of male veterans with PTSD showed support for the automatic-positive reinforcement function of SM (Sacks et al., 2008). Thus, evaluating the function of SM in a population such as of alcohol-dependent patients with PTSD co-morbidity is important.

We assume that a possible influence of SM and PTSD has clinical relevance, because there are reports that both phenomena may point to treatment resistance in this population (Kural et al., 2004; Evren et al., 2006). The present study hypothesises that there is a relationship between SM and PTSD among male patients with alcohol dependency. To take the possible influence of other factors into consideration, we also assessed the trauma history, the severity of alcoholism and the various dimensions of psychopathology. Further, we aimed to determine whether there is something unique about self-mutilators with the PTSD/alcohol dependence co-morbidity, compared with self-mutilators without PTSD in alcohol-dependent inpatients. Although the relationship between PTSD and SM among outpatient women with substance dependence (Harned et al., 2006) and among male veterans (Sacks et al., 2008) was evaluated previously, to our knowledge, this is the first study to evaluate the relationship between SM and PTSD among male subjects with alcohol dependency, which is an important phenomenon in clinical settings. Conducted in Turkey, this study provides knowledge in a cross-cultural context as well.

2. Methods

2.1. Participants

The study was conducted in Bakirkoy State Hospital for Psychiatric and Neurological Diseases, Alcohol and Drug Research, Treatment and Training Center (AMATEM) in Istanbul between January 2007 and January 2008. AMATEM is a specialised centre for substance-use disorders with 85 inpatient beds, and accepts patients from all over Turkey. The Ethical Committee of the hospital approved the study. The patients written informed consent was obtained after the study protocol was thoroughly explained.

A total of 180 consecutively admitted male alcohol-dependent inpatients, without history of any other substance abuse, were considered for participation in the study. All participants fit the Diagnostic and Statistical Manual for Mental Disorders, fourth edition (DSM-IV) diagnostic criteria for alcohol dependence. Excluding criteria were illiteracy, mental retardation or cognitive impairment and co-morbid psychotic disorder. Five patients were excluded due to illiteracy and three patients due to cognitive deficits. Although none of the patients refused to participate in the study, 16 patients were excluded because they left some parts of the scales unfilled, did not give the forms back or left the treatment programme prematurely, that is, before filling the forms. A total of 156 male alcohol-dependent inpatients participated in the study. Interviews with the study group were conducted after a detoxification period, that is, 4–6 weeks after the last day of alcohol use. Although most of the studies on SM among substance dependents were done by the same group of researchers, studies included different participants as was the case in the present study (Evren and Evren, 2005; Evren et al., 2006, 2008).

2.2. Assessment instruments

All patients were assessed by using a semi-structured socio-demographic form. 'Suicide attempt' is defined as an act of self-harm with intent to die that was not self-mutilatory in nature. The interviewer (ED) was specifically trained to discriminate between suicide attempters and self-mutilators. This was assessed by interviewing the patient and the family members, when possible.

The diagnosis of alcohol dependence was based on the clinical examination, a screening interview based on the Structured Clinical Interview for DSM-IV (SCID-I), (First et al., 1997) Turkish version, (Corapcioglu et al., 1999) conducted by a trained interviewer (CE). Other instruments were administered and collected by the same interviewer (psychiatrist ED).

2.2.1. Self-mutilative Behaviour Questionnaire (SMBQ)

Lifetime history of SM was assessed by the clinical interview and was rated on the semi-structured form designed previously by our group for this purpose (Evren and Evren, 2005). SM is defined as an act performed on oneself that is physically violent, intentional and purposeful, although not suicidal. These acts include cutting, burning, hitting oneself, inserting sharp objects into body orifices and pulling out body hair. This definition is similar to the superficial/moderate SM in Favazza's (1998) classification. Responses were dichotomous (yes/no) for each type of SM. Thus, the measure of SM was dichotomous rather than continuous and, therefore, did not reflect severity. To

overcome this limitation, we used the number of SMB episodes as severity of SM (frequency of SM). Self-mutilators were defined as persons, who had one or more incidents (episodes) of lifetime SMB. Each incidence of SMB, separated from the other, was considered as an episode of SM, which supplied information about the recurrence and the severity of SM. Although differences in definition for SM may account for the discrepant results in the literature, the definition used in the present study was also the most-used definition in previous studies (Evren and Evren, 2005; Evren et al., 2006, 2008; Sacks et al., 2008). Alcohol-dependent inpatients with a history of SM constituted the SM group ($n=53$), and those without SM constituted the group without SM ($n=103$). Other than types of SM, age at first SMB, number of SMBs and if the patient was intoxicated with alcohol at the time when he/she self-mutilated (in most of the SMB incidents) were also evaluated. After detailed inquiry, all patients, who gave an affirmative answer, got a physical examination concerning any sequelae of SM. This was done to gain some information about the presence, the severity and the frequency of SM. Duration and number of lifetime episodes of SMB and the age at onset of SMB were also inquired into. Prompting events for SM were not assessed. Although the psychometric properties of this questionnaire were not evaluated, because the studies (including the present study) were not designed for this purpose, it was successfully used in previous studies (Evren and Evren, 2005; Evren et al., 2006, 2008, 2009).

2.2.2. Clinician Administered PTSD Scale (CAPS)

The CAPS is a reliable structured interview designed to assess symptoms of PTSD for frequency and intensity (Blake et al., 1995; Weathers et al., 2001). The CAPS is considered the 'gold standard' for assessing the PTSD diagnosis. It has excellent psychometric properties and utility as a diagnostic instrument (Weathers et al., 2001). PTSD severity was computed as the sum of the frequency and intensity scores. When determining whether participants met the DSM-IV PTSD diagnosis, a frequency score of '1' and intensity score of at least '2' were sufficient for a symptom to be counted. One psychiatrist (ED), who was a trained interviewer, administered the CAPS and collected these data.

2.2.3. Traumatic Experiences Checklist (TEC)

The TEC is a self-report questionnaire covering 29 types of potentially traumatising events with good psychometric characteristics in clinical samples (Nijenhuis et al., 1999). It was found that the internal consistency of the TEC (Cronbach's α test = 0.86, retest = 0.90) was good, as was test-retest reliability over a 3–4-week period ($r=0.91$) and convergent validity (Nijenhuis et al., 2002). The TEC total score presents the number of reported potentially traumatising experiences (range 0–29). In addition, the composite scores per trauma type including emotional neglect, emotional abuse, physical abuse, threat to life, pain, bizarre punishment, sexual harassment and sexual abuse can be calculated in detail. In this study, we used only TEC total scores.

2.2.4. Michigan Alcoholism Screening Test (MAST)

The severity of dependence was assessed by using the MAST (Gibbs, 1985), which was developed as a "rapid and effective screening for lifetime alcohol-related problems and alcoholism" for a variety of populations. Scoring is accomplished after reverse scoring 4 of the 25 items and assigning weighed scores. These weighed scores are then summed; the sum represents a total score reflecting severity of alcohol-related problems. The Turkish version of the MAST is valid and reliable for screening the severity of dependency of both alcohol- and drug-dependent patients (Coskunol et al., 1995). Cronbach's α was 0.74 in the present study.

2.2.5. Symptom Checklist-Revised (SCL-90-R)

Psychopathologic symptoms were assessed with widely used 90-item Symptom Checklist-Revised (SCL-90-R), a self-rating inventory with nine clinical scales for somatisation (12 items), obsessive compulsion (10 items), interpersonal sensitivity (nine items), depression (13 items), anxiety (10 items), hostility (six items), phobic anxiety (seven items), paranoid ideation (six items) and psychoticism (10 items) (Derogatis, 1983). Higher scores in these subscales show the severity of each dimension. The total score and the global severity index (GSI) were considered as a measure of

overall psychopathology. The SCL-90-R is a reliable and valid measure of psychopathology and is widely used in psychiatric researches. In the present study, the Turkish version of SCL-90-R was used (Dag, 1991). Cronbach's α was 0.98 in the present study.

2.3. Statistical Analysis

The statistical package Statistical Packages for the Social Sciences (SPSS) 15.0 for Windows was used for all the analyses. Categorical variables were compared by means of the chi-square statistics. Odds ratios and 95% confidence intervals were calculated. We used Student's *t*-test to compare the groups on continuous variables. Pearson's correlation was used to determine the relationship between frequency of SMB and scale scores. Taking SM as a dependent variable, the Backward Logistic Regression model was performed. Among alcohol dependents with and without PTSD, predictors of SM were evaluated separately with the Backward Logistic Regression models. For all statistical analysis, *P* values were two-tailed and differences were considered significant at $P<0.05$.

3. Results

Among 156 male alcohol-dependent inpatients, 53 (34.0%) had SM and 103 (71.0%) had no SM. Mean age at first SMB was 24.64 ± 8.26 years. Mean number of SMBs was 2.74 ± 1.93 (1–10). Seven (13.2%) of them reported that they were not intoxicated with alcohol when they self-mutilated. Types of SMBs were as follows: self-cutting ($n=26$, 16.7%), cigarette and other burns ($n=5$, 3.2%), hitting hard places with fist or head ($n=18$, 11.5%) and more than one type ($n=4$, 2.5%). Rate of being unemployed was higher and mean of age, duration of education, age at regular alcohol use and rate of being married were lower in patients with SM than patients without SM (Table 1).

Rate of lifetime PTSD was 32.1% ($n=50$) and, among them, 50% (25) had SM. In the PTSD subgroup, 96% ($n=24$) of self-mutilators were intoxicated with alcohol when they self-mutilated, whereas this rate was 78.6% ($n=22$) in the non-PTSD group ($n=28$) ($\chi^2=3.5$, $df=1$, $P=0.069$). The mean of current age was lower in the SM group with PTSD (38.44 ± 6.87 years) than in non-SM group with PTSD (45.52 ± 7.04 years) ($t=3.60$, $P=0.001$). Duration of education, age at regular alcohol use, marital and employment status did not differ significantly between these two groups (not shown).

Mean scores of subscales and GSI of SCL-90, TEC and MAST were higher in the SM group. In accordance with these results, number of SM showed positive correlations with the scale scores (Table 2). Similarly, among patients with PTSD, subscales (other than obsessionality subscale) of SCL-90, TEC and MAST showed higher scores in those with SM. Further, number of SM was positively correlated with subscale scores (other than obsessionality) of SCL-90 and MAST (Table 3).

Rates of suicide-attempt history, alcohol abuse in the family and history of any trauma (defined as having one or more incidents of lifetime trauma, according to the TEC) were all higher in patients with SM than those without. Further, rate of lifetime PTSD was higher in the SM group and risk was 2.8 times higher (Table 4). When only

Table 1
Sociodemographic variables.

	No Self-Mutilation		Self-Mutilation		χ^2	d.f.	<i>P</i>
	<i>N</i> = 103	%	<i>N</i> = 53	%			
Age (mean \pm S.D.)	47.1	8.1	38.7	8.4	$t=6.06$		<0.001
Duration of education (mean \pm S.D.)	10.1	4.1	8.6	3.4	$t=2.26$		0.025
Age at regular substance use (mean \pm S.D.)	27.0	8.9	22.9	6.2	$t=3.38$		0.001
Marital status					8.38	2	0.015
Married	70	68.0	24	45.3			
Divorced, Widow, Separate	6	5.8	8	15.1			
Single	27	26.2	21	39.6			
Employment status					8.45	3	0.038
Without employment	30	29.1	21	39.6			
With employment	39	37.9	18	34.0			
Part time	10	9.7	10	18.9			
Retired	24	23.3	4	7.5			

Table 2
Scale scores among alcohol dependent men ($n = 156$) according to the self-mutilation status.

Scale scores	Frequency of Self-Mutilation	No Self-Mutilation ($n = 103$)		Self-Mutilation ($n = 53$)		t	P
	r†	mean	S.D.	mean	S.D.		
SCL-90 global severity index	0.35*	1.26	0.72	1.84	0.90	-4.07	<0.001
Somatization	0.29*	1.14	0.76	1.62	1.06	-2.92	0.005
Anxiety	0.36*	1.19	0.88	1.96	1.08	-4.75	<0.001
Obsessionality	0.21**	1.52	0.84	1.92	0.81	-2.88	0.005
Depression	0.30*	1.48	0.92	2.02	1.09	-3.11	0.003
Interpersonal Sensitivity	0.29*	1.40	0.88	2.01	1.08	-3.55	0.003
Psychoticism	0.29*	0.91	0.67	1.36	0.84	-3.38	0.001
Paranoia	0.34*	1.35	0.89	2.02	1.02	-4.23	<0.001
Hostility	0.41*	1.16	0.90	1.98	1.09	-5.04	<0.001
Phobia	0.33*	0.74	0.71	1.42	1.17	-3.86	<0.001
TEC total score	0.28**	3.37	2.56	6.00	3.99	-4.36	<0.001
MAST	0.19***	25.93	10.61	31.15	8.85	-3.07	0.003

†: Pearson's correlation, TEC: Traumatic Experiences Checklist, MAST: Michigan Alcoholism Screening Test, * $P < 0.001$, ** $P < 0.01$, *** $P < 0.05$.

patients with PTSD ($n = 50$) were evaluated, subscores and mean total CAPS score of the SM group (60.08 ± 18.87) were not significantly different from those of the non-SM group (55.36 ± 15.19) ($t = -0.97$, $P = 0.34$) (not shown).

Taking SM as a dependent variable, the Backward Logistic Regression model was performed. The total sample ($n = 156$) was included in this analyses. Age at starting regular alcohol use, history of trauma, history of lifetime PTSD diagnosis, history of suicide attempt, subscales of SCL-90 (somatisation, obsessive compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism) and MAST scores were independent variables in this model. Suicide-attempt history, age at onset of regular alcohol use, anxiety, depression and hostility predicted SM (Table 5). Determinants of SM in the Backward Logistic Regression models among alcohol dependents with PTSD ($n = 50$) and without PTSD ($n = 106$) were also evaluated separately. In both these analyses, age at onset of regular alcohol use, history of suicide attempt, subscales of SCL-90 and MAST scores were taken as independent variables. History of suicide attempt, age at onset of regular alcohol use, anxiety, depression and somatisation predicted SM in the non-PTSD group, whereas hostility was the only predictor for SM in the PTSD group in the regression model (Table 5).

Table 3
Scale scores among alcohol dependent men with PTSD ($n = 50$) according to the self-mutilation status.

Scale scores	Frequency of Self-Mutilation	No Self-Mutilation ($n = 25$)		Self-Mutilation ($n = 25$)		t	P
	r†	mean	S.D.	mean	S.D.		
SCL-90 global severity index	0.43**	1.50	0.67	2.20	0.75	-3.46	0.001
Somatization	0.48*	1.31	0.73	2.07	0.82	-3.46	0.001
Anxiety	0.39**	1.47	0.90	2.30	0.90	-3.27	0.002
Obsessionality	0.17	1.89	0.80	2.21	0.72	-1.49	0.14
Depression	0.30***	1.77	0.86	2.35	0.91	-2.30	0.026
Interpersonal Sensitivity	0.39**	1.58	0.83	2.36	0.89	-3.22	0.002
Psychoticism	0.44**	1.13	0.62	1.70	0.74	-2.93	0.005
Paranoia	0.40**	1.54	0.74	2.36	0.92	-3.47	0.001
Hostility	0.53*	1.31	0.66	2.47	0.97	-4.94	<0.001
Phobia	0.41**	0.99	0.73	1.80	1.07	-3.12	0.003
TEC total score	0.31***‡	4.00	2.22	6.80	4.12	-2.99	0.005
MAST	0.19	31.04	8.97	33.76	9.11	-1.06	0.29

†: Pearson's correlation, ‡: Spearman's correlation, TEC: Traumatic Experiences Checklist, MAST: Michigan Alcoholism Screening Test, * $P < 0.001$, ** $P < 0.01$, *** $P < 0.05$.

Table 4
History of suicide attempt, history of any trauma and lifetime PTSD diagnosis in alcohol dependent men with and without self-mutilation.

	No Self-Mutilation		Self-Mutilation		χ^2	S.D.	P
	N = 103	%	N = 53	%			
History of suicide attempt ^a	9	8.7	21	39.6	21.49	1	<0.001
History of any trauma ^b	43	41.7	34	64.2	7.03	1	0.008
Lifetime PTSD ^c	25	24.3	25	47.2	8.43	1	0.004

Odds Ratio (95% Confidence Interval): ^a 6.85 (2.85–16.49), ^b 2.50 (1.26–4.95), ^c 2.79 (1.38–5.63).

4. Discussion

The rate of SM found in this study (34.0%) was in concordance with the rates found among alcohol dependents in previous studies (26–29%) (Evans and Lacey, 1992; Turell and Armsworth, 2000; Evren et al., 2008). Further, similar to Sacks et al.'s (2008) study, half of the patients with PTSD co-morbidity had SM in the present study. Significant associations between SM and higher rates of trauma history, PTSD and general psychopathology, particularly hostility, were detected. Further, the present study documented that early onset of alcohol use, hostility (Evren et al., 2008), suicide-attempt history (Evren and Evren, 2005, 2006) and also negative affect, such as anxiety and depression, predicted SM among men with alcohol dependency, consistent with the previous studies. Age at onset of regular alcohol use, suicide-attempt history, anxiety, depression and somatisation predicted SM in the subgroup without PTSD. In the subgroup of patients with PTSD, hostility was the only predictor for SM. These findings are consistent with the previous study, which reported higher severity of PTSD, depression, hostility and impulsivity in self-mutilative male veterans with PTSD, compared with those who did not engage in SM (Sacks et al., 2008).

Age may play an important role in the occurrence of SM, with a higher incidence of SM often found among younger individuals (Briere and Gil, 1998; Sacks et al., 2008). Previous studies also documented that patients with SM were younger with an earlier age of onset of substance (Evren and Evren, 2005, 2006) and alcohol abuse (Evren et al., 2008, 2009). Most of the patients were intoxicated with alcohol before the act of SM (Evren et al., 2008), supporting the idea that the association between alcohol misuse and SM may reflect the disinhibiting role of alcohol (Hawton et al., 2004). Early onset of regular alcohol use among self-mutilators and the first SMB being later than the onset of regular alcohol use may, at least partially, explain the high rates of SM among alcohol dependents. Another interpretation of the results is that SMB and alcohol use may serve the same reinforcement function, accounting for their high co-occurrence (Nock and Prinstein, 2005). Consistent with our results in alcohol dependents with PTSD co-morbidity, younger male veterans with PTSD were found to be engaged in SM behaviour to a greater extent in a previous study (Sacks et al., 2008).

In previous studies, SM was related to suicide-attempt history (Hawton and Fagg, 1992; Nordentoft and Rubin, 1993; Favazza, 1998) and suicide-attempt history predicted SM both in substance dependents (Evren and Evren, 2005, 2006) and among male inmates (Matsumoto et al., 2005). Suicide (at least one suicide attempt) rates of the self-mutilators among substance-dependent patients ranged between 53.2% and 67.6% (Evren and Evren, 2005, 2006) and it was 41.2% among alcohol-dependent patients (Evren et al., 2008). The anti-suicide model views SM function as a coping mechanism for resisting urges to attempt suicide, such that SM serves as a replacement for or compromise with the desire to commit suicide (Klonsky, 2007). Consistent with this, male gender and substance-use disorders are significant risk factors for later suicide in patients with SM (Suominen et al., 2004). Among outpatient women with co-morbid PTSD and substance dependence, both disorders were perceived as contributing to SM and suicidal behaviour (Harned et

Table 5
Determinants of self-mutilation in Backward Logistic Regression models in alcohol dependent men.

	B	S.E.	Wald	d.f.	P	Exp(B)	95.0% C.I.
<i>Total sample (n = 156)*</i>							
Age at onset of regular alcohol use	−0.060	0.030	4.057	1	0.044	0.942	0.889–0.998
Anxiety	1.025	0.410	6.266	1	0.012	2.788	1.249–6.221
Depression	−1.090	0.421	6.714	1	0.010	0.336	0.147–0.767
Hostility	0.793	0.342	5.390	1	0.020	2.211	1.132–4.319
Suicide attempt history	−1.833	0.522	12.341	1	<0.001	0.160	0.058–0.445
<i>Non-PTSD group (n = 106)**</i>							
Age at onset of regular alcohol use	−0.092	0.041	5.081	1	0.024	0.912	0.842–0.988
Anxiety	2.591	0.742	12.183	1	<0.001	13.340	3.114–57.147
Depression	−1.346	0.564	5.689	1	0.017	0.260	0.086–0.787
Somatization	−1.391	0.615	5.118	1	0.024	0.249	0.075–0.830
Suicide attempt history	−2.728	0.836	10.660	1	0.001	0.065	0.013–0.336
<i>PTSD group (n = 50)**</i>							
Hostility	1.664	0.483	11.859	1	0.001	5.278	2.048–13.603

*Age at onset of regular alcohol use, history of trauma, history of lifetime PTSD diagnosis, history of suicide attempt, subscales of SCL-90 and Michigan Alcoholism Screening Test (MAST) scores were independent variables. **Age at onset of regular alcohol use, history of trauma, history of suicide attempt, subscales of SCL-90 and MAST scores were independent variables. d.f.: degrees of freedom. C.I.: Confidence Interval.

al., 2006). Further, attempted suicide and SM are risk factors for PTSD in outpatient adolescents (Jacobson et al., 2008). Thus, although they are distinct behaviours, SMB can be considered as a risk factor for suicide attempt and higher severity of eventual psychopathology. Indeed, as reflected by several scale scores including the SCL-90, the MAST, and the presence of trauma history and/or PTSD in the present study, alcohol-dependent men with SM had, overall, a more severe clinical condition than those without SM. Thus, the relationship between SM and PTSD may illuminate one factor, which leads to a more severe course of alcoholism among men. Consistent with previous research conducted among different populations (van der Kolk et al., 1991; Zweig-Frank et al., 1994; Briere and Gil, 1998), as well as substance-dependent samples (Evren and Evren, 2005, 2006), and alcohol dependents in particular (Evren et al., 2008), the present study revealed that high rates of trauma was also associated with SM. Childhood traumatic experience causes vulnerabilities in the child's adaptive resources, which necessitate the application of alternative regulatory and relational strategies, such as SM, to the negotiation of contemporaneous and prospective developmental issues (Yates, 2004). Among adolescents, relationship between childhood sexual abuse and the presence and frequency of SM were mediated by PTSD symptoms (Weierich and Nock, 2008). Finding both trauma history and PTSD to be related with SM, but not predicting SM, suggests that other factors such as negative affect (i.e., anxiety, depression) and hostility may have a mediating role in this relationship among alcohol dependents.

Possible links between SMB and hostility have been implicated in previous studies (Soloff et al., 1994; Herpertz et al., 1997). In the study among adolescent students, prior to SM, feelings of both hostility and anxiety were described, which indicated support for the hostility model of SM (Ross and Heath, 2003). In a recent study conducted among male veterans with PTSD, it was found that SM was related to hostility (Sacks et al., 2008). Finally, hostility was the predictor of SM in alcohol-dependent inpatients (Evren et al., 2008). The findings of the present study suggested that different models of SM might elucidate SM in different subgroups of alcohol-dependent inpatients. Thus, in male alcohol-dependent inpatients without PTSD, the possible functions of SM might be to distract the individual from internally experienced emotional distress and to reduce their experience of negative emotional states such as depression or anxiety (Briere and Gil, 1998), signifying the automatic-negative reinforcement effect (Nock and Prinstein, 2005). SM may also function as a coping mechanism for resisting urges to attempt suicide, indicating the anti-suicide effect (Klonsky, 2007). However, among inpatients with PTSD, results indicated support for the hostility model of SM (Ross and Heath, 2003). These findings

suggests that there is no single function for SM in alcohol dependents and all these models might be, at least, a partial explanation for this act in this population. Further, the functions of SM may differ not only according to the population that is studied, but also within subgroups in the same population. The clinical implication of these findings is that, to reduce SMB among alcohol-dependent patients, clinicians must address different issues in different subgroup patients, that is, focussing hostility in those with PTSD co-morbidity.

The present study has several limitations. First, because this study is cross-sectional, its findings cannot indicate the causal relationships among the primary constructs of interest. Second, given that women are twice as likely as men to develop PTSD during their lifetimes (Kessler et al., 1995), female patients may have a different profile concerning PTSD and SM. It is noted that SM, PTSD and childhood abuse are all related to personality disorders, particularly BPD, which was not assessed in the present study (Spitzer et al., 2000). This may also be considered as a limitation of the study. Nevertheless, a study showed that outpatients with substance abuse or PTSD may be at risk for SM, independent of BPD (Zlotnick et al., 1999).

Nevertheless, at the minimum, these findings suggest to the clinician that a history of SM may alert them to patients with difficult and complex psychopathology, who may have more severe and chronic illness. Thus, clinicians working with alcohol-dependent patients may consider specifically assessing for and treating SM. There are specific intervention techniques designed to reduce SMB and to increase effective coping skills, such as components of dialectical behaviour therapy (DBT; Linehan et al., 1999). Further inquiries on correlates of SM among alcohol-dependent men may lead to insights useful in treatment interventions with this population.

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