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**Author:** Noorden, Martijn Sander van

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## **Chapter 4**

Prevalence and correlates of lifetime deliberate self-harm and suicidal ideation in naturalistic outpatients: the Leiden Routine Outcome Monitoring Study

Suzanne de Klerk\*  
Martijn van Noorden\*  
Anne van Giezen  
Philip Spinhoven  
Margien den-Hollander-Gijsman  
Erik Giltay  
Anne Speckens  
Frans Zitman

\*Joint first authors

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## Abstract

**Background:** Deliberate self-harm and suicidal ideation (DSHI) are common phenomena in general and mental health populations. Identifying factors associated with DSHI may contribute to the early identification, prevention and treatment of DSHI. Aims of the study are to determine the prevalence and correlates of lifetime DSHI in a naturalistic sample of psychiatric outpatients with mood, anxiety or somatoform (MAS) disorders.

**Methods:** Of 3,798 consecutive patients from January 2004 to December 2006, 2,844 (74.9%) patients were analysed (mean age=37.5, SD=12.0; age range: 18-65; 62.7% women). Lifetime DSHI was assessed with Routine Outcome Monitoring (ROM), including demographic parameters, DSM-IV diagnosis, depressive symptoms, symptoms of anxiety, general psychopathology and personality traits.

**Results:** Of the 2,844 subjects, 55% reported lifetime DSHI. In multivariable logistic regression analysis, the most important factors associated with lifetime DSHI were being unmarried, low education, high number of psychiatric diagnoses, lower anxiety scores, higher depression scores and the personality trait of emotional dysregulation.

Limitations: Deliberate self-harm may have been under-reported in self-report questionnaires; the assessment of personality traits may have been influenced by state psychopathology; traumatic events were not assessed.

**Discussion:** The findings suggest that DSHI is common among psychiatric outpatients with MAS disorders and that current symptoms and underlying personality vulnerabilities were independently involved in DSHI. Whether symptoms of somatic anxiety are protective should be confirmed in subsequent studies. These findings may help clinicians in identifying patients at risk for deliberate self-harm and suicide.

## Introduction

Deliberate self-harm is a common problem in the general population, as well as in psychiatric populations (Briere & Gil, 1998; Klonsky et al., 2003). It has been defined as the intentional self-injury without (conscious) suicidal intent (Chapman et al., 2006; Klonsky et al., 2003), or as behaviour that was self-initiated with the intent to harm the body, regardless of intent to die (De Leo et al., 2004; Schmidtke et al., 2004). In the current study, both non-suicidal and suicidal self-harm, as well as thoughts about self-harm and suicide were analysed (deliberate self-harm or ideation; DSHI).

With regard to deliberate self-harm *behaviour*, a lifetime prevalence of 4% was found in nonclinical populations in the US (Briere & Gil, 1998; Klonsky et al., 2003). Prevalence rates in selected populations were higher, especially for adolescents (7%-9%; Hawton et al., 2002; Skegg, 2005) and psychiatric inpatients (21%-61%; Briere & Gil, 1998; Suyemoto, 1998). In the UK, an estimated 170,000 deliberate self-harm patients per year are admitted at emergency departments of general hospitals with deliberate self-poisoning (Kapur et al., 1998). The most frequent presentations of deliberate self-harm behaviour are skin-cutting and self-poisoning (Hawton et al., 2002; Schnyder et al., 1999). With regard to deliberate self-harm *ideation* in community samples, lifetime prevalence rates of 11%-14% were found for adults (Kessler et al., 1999; Ten Have et al., 2009) and 19% for adolescents (Evans et al., 2005a). Besides the fact that DSHI is a prevalent problem in various populations, persistence is also very common (Owens et al., 2002) and a history of DSHI increases the risk of a completed suicide (Cooper et al., 2005; Hawton et al., 2003; Hawton & Harriss, 2007; Kapur et al., 2006; Suominen et al., 2004; Sinclair et al., 2010).

According to a large adult community survey the factors that were associated with deliberate self-harm and respectively with suicidal ideation were largely identical (Ten Have et al., 2009). Sociodemographic factors such as younger age and female sex were found to be related to DSHI. (Kessler et al., 1999; Kessler et al., 2005; Schmidtke et al., 1996; Evans et al., 2005b). Subjects with low socio-economic status (Schmidtke et al., 1996) and divorced subjects (Kessler et al., 1999; Petronis et al., 1990) were more likely to engage in DSHI.

Disease-related predictors of DSHI in community and clinical populations were the presence of psychiatric symptoms and disorders, such as major depression, substance abuse and anxiety disorders (Kessler et al., 1999; Haw et al., 2001; Plener et al., 2009). With regard to psychiatric symptoms, adolescents with DSHI showed higher levels of depressive (Hawton et al., 2002) and anxiety symptoms, and used more alcohol (Haavisto et al., 2005; Ross and Heath, 2002; Tuisku et al., 2009).

General vulnerability factors such as personality traits and emotion regulation difficulties were found to be related to DSHI in community and clinical samples. The presence of DSHI was increased in patients with personality disorders, especially in patients with borderline personality disorder (Shearer et al., 1988; Haw et al., 2001). Some of the Big-Five personality traits (neuroticism, agreeableness, extraversion, conscientiousness and openness to experience) were also described to be related to lifetime DSHI. In several community sample studies neuroticism was significantly higher in patients with a history of DSHI compared to non-DSHI patients (Brown et al., 2007; Kessler et al., 1999; Klonsky et al., 2003; Williams & Hassanyeh, 1983). Brown found higher levels of neuroticism and openness to experience, and lower levels of agreeableness and conscientiousness in college students who had a history of (non-suicidal) self-harm compared to controls (Brown et al., 2009). Additionally, in a study by Klonsky et al., military recruits reporting a history of self-harm showed more personality pathology traits (borderline, schizotypal, dependent and avoidant) compared to the non-self-harm group (Klonsky et al., 2003). They also found a coherent 'self-harm personality profile', according to self- and peer reports: individuals with a history of self-harm tended to have strange and intense emotions and a heightened sensitivity to interpersonal rejection. 'Emotion dysregulation' difficulties in responding to one's own emotions as a personality trait, may play a central role in DSHI (Chapman et al., 2006; Linehan, 1993; Gratz & Roemer, 2008). A study of DSHI risk factors in male students (Gratz & Chapman, 2007) found emotion dysregulation to distinguish between men with and without DSHI.

Most studies of DSHI focus on the general community, students or inpatients. Knowledge about DSHI-related factors regarding outpatients with common mental disorders such as mood, anxiety and somatoform disorders in a naturalistic mental health care setting is scarce. Identifying associative factors of DSHI is of clinical importance and may assist clinicians, social workers, prevention workers and policy makers in the identification, prevention and treatment of DSHI and eventually, in preventing suicide. In this explorative study, we aimed to investigate the prevalence rate of lifetime DSHI and its demographic and disease specific correlates in a large Dutch naturalistic outpatient mental health population.

## Methods

### Subjects and procedure

The sample consisted of 3,798 outpatients from the Dutch Regional Mental Health Provider (RMHP) Rivierduinen and the psychiatric outpatient department of the Leiden University Medical Center (LUMC). Patients were referred to one of these locations for treatment of a mood, anxiety or somatoform (MAS) disorder between January 2004 and December 2006. All outpatients that enter the clinics were routinely assessed with Routine Outcome Monitoring (ROM), as part of the usual diagnostic procedure (De Beurs et al., 2010). ROM consists of an extensive battery of psychometric instruments, both self-report and interviewer-based. All interviewer-based measurements were carried out by trained research nurses or psychologists. Self-report questionnaires were completed using a touch-screen computer. The assessment took about 120 minutes. Only patients with insufficient mastery of the Dutch language and patients who were unable to complete computerised and written questionnaires were ineligible for ROM. Approximately, 80% of the referred MAS patients were assessed with ROM in the study period. For the current study, we used baseline ROM assessments only.

Of the 3,798 outpatients, 2,844 patients between the age of 18 to 65 had complete data on variables of interest and were analysed (74.9%; Figure 4.1). In total, 116 patients were excluded because of their age and 838 patients were excluded because they had missing data. The main reason for missing data (N=395) was that the Dimensional Assessment of Personality Pathology-Basic Questionnaire Short Form (DAPP-SF) had been introduced in ROM gradually. Mean age of the excluded patients was significantly higher in comparison with the included group ( $M=39.6$  vs.  $37.5$ ,  $p<0.001$ ). The excluded patients had significantly higher scores on general psychopathology (BSI;  $M=1.4$  vs.  $1.2$ ,  $p<0.001$ ), depression and anxiety (MADRS;  $M=19.9$  vs.  $17.7$ ,  $p<0.001$ , BAS;  $M=15.8$  vs.  $14.2$ ,  $p<0.001$ ). The groups also differed on nationality and employment status (in the excluded patients less people were Dutch,  $p<0.001$  or employed,  $p<0.001$ ). Finally, excluded patients were more likely to be married or had a partner than the included patients ( $p<0.05$ ). Concerning DSHI (N=448), education, number of diagnoses, gender, housing and suicide attempt history no differences were found between the included and excluded patients. Of the final 2,844 patients, 1,061 patients were male (37.3 %; mean age=38.8, SD=11.8) and 1,783 were female (62.7 %; mean age=36.7, SD=12.0).

## Measures

*Demographics:* For the current study, demographic variables were obtained using a self-report questionnaire that assessed age, gender, ethnic background, education, marital status, housing situation and employment status. A Dutch ethnic background was assumed when the patient and both parents were born in the Netherlands. 'Other ethnicity' was scored when these criteria were not fulfilled.

*DSHI and personality pathology:* To assess lifetime DSHI and personality pathology, the DAPP-SF was used (Van Kampen et al., 2008). The DAPP-SF contains 136 items and consists of 18 subscales covering clinically relevant dimensions of personality pathology, namely: Submissiveness, Cognitive Distortion, Identity Problems, Affective Lability, Stimulus Seeking, Compulsivity, Restricted Expression, Callousness, Oppositionality, Intimacy Problems, Rejection, Anxiousness, Conduct Problems, Suspiciousness, Social Avoidance, Narcissism, Insecure Attachment and Self-Harm. The latter subscale was used to measure DSHI.

There are four higher-order constructs containing several subscales, namely Emotional Dysregulation, Dissocial Behaviour, Inhibition and Compulsivity. The items of the DAPP-SF are rated on a 5-point Likert scale, with scores ranging from 1 ("very unlike me") to 5 ("very like me"). A high total (and subscale) score indicates the presence of (a) deviant personality trait(s). The Self-Harm subscale consists of 6 items and measures lifetime self-harm ideation and behaviour, specifically a history of self-poisoning (1 item), repetitive self-injury (1 item) and suicidal ideation and intent (4 items) ranging from 1 to 5 (mean score). The DAPP-SF has good psychometric properties. Cronbach's alpha of the subscale Self-Harm in a previous sample with MAS disorders was 0.88. and respectively 0.90 in a sample with personality disorders. Furthermore, the subscale correlated strong with general psychopathology (De Beurs et al., 2009). Cronbach's alpha in the current sample was respectively 0.96 for the total DAPP-SF, 0.89 for the DSHI subscale, 0.97 for emotional dysregulation, 0.88 for dissocial behaviour, 0.80 for inhibition and 0.84 for compulsivity. Also the subscales had satisfactory internal consistencies, ranging from 0.77 (conduct problems) to 0.91 (suspiciousness). We defined the presence of self-harm as a score of  $\geq 2$  on the self-injury and/or the self-poisoning item. The presence of self-harm ideation was defined if subject scored  $\geq 2$  on one or more suicidal ideation and intent items.

*Psychiatric diagnosis:* Diagnostic status according to the Diagnostic and Statistical Manual of Mental Disorders IV-TR (American Psychiatric Association, 2000) was assessed with the Dutch version of the MINI International Neuropsychiatric Interview Plus, version 5.00-R; MINI-Plus, a standardised diagnostic interview (Sheehan et al., 1998; Van

Vliet & De Beurs, 2007). The interview consists of 23 modules in which the presence or absence of DSM-IV criteria for the main psychiatric disorders was examined. The presence of a 'prior suicide attempt' and the amount of Axis I disorders was also assessed with the MINI-Plus. The MINI-plus was tested in different samples and appeared to have good psychometric properties (Sheehan et al., 1998; Lecrubier et al., 1997).

*Psychiatric symptoms:* Depressive and anxiety symptoms were measured by the Montgomery-Åsberg Depression Rating Scale (MADRS; Montgomery & Åsberg, 1979) and the Brief Anxiety Scale (BAS; Tyrer et al., 1984). The MADRS and the BAS have good psychometric properties (Goekoop et al., 1994). Cronbach's alpha for the MADRS in the current sample was 0.86 and for the BAS 0.68. General Psychopathology was measured by the Brief Symptom Inventory (BSI; Derogatis, 1975). This is a shortened version of the Symptom Checklist (SCL-90) and contains 53 self-report items. The BSI measures current symptoms of psychopathology in adults covering nine symptom dimensions and three global indices of distress (Derogatis, 1975; De Beurs & Zitman, 2006). The respondent indicates to what extent they have been bothered by a symptom in the past week, including today, with scores ranging from 0 ("not at all") to 5 ("extremely"). The Dutch translation of the BSI has good psychometric properties (De Beurs & Zitman, 2006). In the current sample, the Cronbach's alpha for the BSI was 0.97.

### **Statistical Analyses**

Patients were categorised in three groups with no, intermediate and high DSHI (i.e., tertiles) in order to increase clarity and interpretability of the results. The chi-squared test for linear-by-linear association or Kruskal-Wallis nonparametric test were used to analyse associations with categorical and ordinal variables, respectively. A prediction model was built in which contributing factors to DSHI were added to a multinomial logistic regression analysis, and the potential predictive factors were chosen by univariable analysis ( $p < 0.1$ ), while age and gender were forced into the model. In Table 4.4, associations are presented as odds ratios (OR) with 95% confidence intervals (95% CI) per one standard deviation increase in predictive factor (per 1-SD using z-scores; to facilitate the comparison between different predictive factors), in which no DSHI was considered the reference category. The associations with predictor factors were examined using multivariable linear regression analysis, and these associations are presented as the p-value for linear trend over the tertiles of DSHI (i.e., 1, 2 or 3). In addition, forward stepwise linear regression analysis was used to find the minimum subset of independent predictive factors of DSHI from the longer list of possible factors. In this final model, the stringent significance levels of 0.01 for removal and of 0.005 for entry were chosen, and age and sex were forced into

the model. A two sided p-value of  $<0.05$  was considered statistically significant, and the statistical analyses were performed using SPSS version 17.0 statistical software.

## Results

### Descriptives

In total, 1,549 patients (54.5%; 95% confidence interval [CI]: 52.6%-56.3%) reported lifetime DSHI, based on the tertile distribution of the DAPP-SF. The sample consisted of 1,295 (45.5%) patients with no DSHI, 597 patients (21.0%) with intermediate DSHI and 952 patients (33.5%) with high DSHI. Because of the large number of subjects with no DSHI, the tertiles were not equally distributed. Of the total 2,844 patients, 689 (24.2%) reported a history of self-harm or suicide attempt whereas 1,433 (50.4%) reported a history of suicidal ideation. 573 subjects (20.1%) reported suicidal ideation *and* self-harm or a suicide attempt. According to the MINI International Neuropsychiatric Interview-Plus (MINI-Plus) 411 subjects (14.5%) reported a prior suicide attempt. Of the 2,844 patients 1,300 (45.7%) had a current depression or dysthymia, 1,224 (43.0%) a current anxiety disorder, 368 (12.9%) a current somatoform disorder, and 672 (23.6%) had no MAS disorder. Comorbidity of MAS disorders occurred in 748 (26.3%) patients.

### Demographic variables and DSHI

Table 4.1 presents demographic characteristics of the sample according to DSHI group. Linear-by-linear association revealed no significant trend for gender and DSHI group. Linear-by-linear association tests revealed a significant increasing association of other ethnicity from no DSHI (14.2%), to intermediate DSHI (19.4%) and high DSHI (19.7%),  $\chi^2(1, 2844)=12.60, p<0.001$ , and respectively for being unmarried with DSHI group,  $\chi^2(1, 2844)=65.65, p<0.001$ , living alone or with family with DSHI group,  $\chi^2(2, 2844)=55.77, p<0.001$ , lower education with DSHI group,  $\chi^2(1, 2844)=6.67, p<0.05$ , being unemployed with DSHI group,  $\chi^2(1, =2844)=41.22, p<0.001$  and younger age with DSHI group,  $F(1, 2841)=8.62, p<0.005$ .

**Table 4.1.** Sociodemographic characteristics in total sample and according to level of DSHI in 2,844 outpatients

	Total sample	Tertiles of DSHI			p-value (linear-by-linear)
	(n=2844, 100%)	No DSHI (n=1295, 45.5%)	Intermediate DSHI (n=597, 21.0%)	High DSHI (n=952, 33.5%)	
DSHI median (range)	1.2 (1-5)	1 (1-1)	1.3 (1.2-1.7)	2.7 (1.8-5)	-
Age (mean ± SD)	37.5 ± 12.0	38.2 ± 12.0	37.4 ± 11.6	36.7 ± 12.0	0.003
Gender (n, %)					0.510
Male	1061 (37.3)	466 (36.0)	242 (40.5)	353 (37.1)	
Female	1783 (62.7)	829 (64.0)	355 (59.5)	599 (62.9)	
Ethnic Background (n, %)					<0.001
Dutch	2356 (82.8)	1111 (85.8)	481 (80.6)	764 (80.3)	
Other ethnicity	488 (17.2)	184 (14.2)	116 (19.4)	188 (19.7)	
Marital status (n, %)					<0.001
Married	1432 (50.4)	743 (57.4)	309 (51.8)	380 (39.9)	
Unmarried	1412 (49.6)	552 (42.6)	288 (48.2)	572 (60.1)	
Housing situation (n, %)					<0.001
Living with partner	1465 (51.5)	747 (57.7)	323 (54.1)	395 (41.5)	
Living alone or with family	1379 (48.5)	548 (42.3)	274 (45.9)	557 (58.5)	
Educational status (n, %)					0.01
Higher education	1219 (42.9)	757 (58.5)	367 (61.5)	501 (52.6)	
Lower education	1625 (57.1)	538 (41.5)	230 (38.5)	451 (47.4)	
Employment status (n, %)					<0.001
Employed	1331 (46.8)	680 (52.5)	282 (47.2)	369 (38.8)	
Unemployed	1513 (53.2)	615 (47.5)	315 (52.8)	583 (61.2)	

Abbreviations: DSHI: Deliberate Self-Harm or Ideation; SD: Standard Deviation

### Disease-related variables: psychiatric disorders and DSHI

Table 4.2 shows psychiatric disorders and symptoms according to the level of DSHI. Significant linear-by-linear associations were found for all MAS disorders with DSHI group except for dysthymia. Linear-by-linear associations revealed a significant association between increasing prevalence rates of depression and anxiety disorders for each subsequent DSHI group, except for panic disorder, generalised anxiety disorder and somatoform disorder, where the test revealed a significant inverse association. Additionally, a significant increasing association was found for alcohol and drug abuse or dependence from no DSHI (2.6%; 2.2% for alcohol and drug abuse or dependence, respectively), intermediate DSHI (4.7%; 3.9%) to high DSHI (8.7%; 7.4%),  $\chi^2(1, 2844)=41.41$ ,  $p<0.001$ ;  $\chi^2(1, 2844) =35.63$ ,  $p<0.001$ ). Linear-by-linear associations also revealed a significant increasing association of the number of diagnoses,  $F(1, 2841)=111.33$ ,  $p<0.001$ , depressive symptoms (MADRS),  $F(1, 2841)=484.14$ ,  $p<0.001$ , symptoms of anxiety (BAS),  $F(1, 2841)=76.37$ ,  $p<0.001$ , and general psychopathology,  $F(1, 2841)=569.42$ ,  $p<0.001$  from no DSHI, to intermediate and high DSHI.

**Table 4.2.** Psychiatric disorders (MINI-diagnoses) and symptoms in total sample and according to the level of DSHI in 2844 outpatients

	Total sample (n=2844, 100%)	Tertiles of DSHI			p-value for trend (linear-by-linear) <sup>a</sup>
		No DSHI (n=1295, 45.5%)	Intermediate DSHI (n=597, 21.0%)	High DSHI (n=952, 33.5%)	
<b>Psychiatric disorders (n, %)</b>					
Mood disorder					
Depression	1191 (41.9)	364 (28.1)	241 (40.4)	586 (61.6)	<0.001
Dysthymic disorder	109 (3.8)	43 (3.3)	26 (4.4)	40 (4.2)	0.26
Anxiety disorder					
Posttraumatic stress disorder	286 (10.1)	96 (7.4)	54 (9.0)	136 (14.3)	<0.001
Social phobia	353 (12.4)	130 (10.0)	83 (13.9)	141 (14.7)	0.001
Obsessive compulsive disorder	133 (4.7)	44 (3.4)	36 (6.0)	53 (5.6)	0.012
Panic disorder	334 (11.7)	177 (13.7)	64 (10.7)	93 (9.8)	0.004
Generalized anxiety disorder	163 (5.7)	82 (6.3)	41 (6.9)	40 (4.2)	0.041
Any somatoform disorder	461 (16.2)	255 (19.7)	80 (13.4)	126 (13.2)	<0.001
Alcohol abuse or dependence	145 (5.1)	34 (2.6)	28 (4.7)	83 (8.7)	<0.001
Drug abuse or dependence	121 (4.3)	28 (2.2)	23 (3.9)	70 (7.4)	<0.001
Prior suicide attempt (MINI)	411 (14.5)	39 (3.0)	80 (13.4)	292 (30.7)	<0.001
Total number of diagnoses (mean ± SD)	2.0 ± 1.2	1.7 ± 1.1	2.0 ± 1.2	2.3 ± 1.3	<0.001
<b>Psychiatric symptoms (mean ± SD)</b>					
Depressive symptoms (MADRS)	17.7 ± 9.8	14.1 ± 8.6	17.7 ± 9.2	22.7 ± 9.5	<0.001
Symptoms of anxiety (BAS)	14.2 ± 6.8	13.1 ± 6.6	14.6 ± 7.0	15.6 ± 6.7	<0.001
General Psychopathology (BSI)	1.2 ± 0.7	0.9 ± 0.6	1.2 ± 0.7	1.5 ± 0.7	<0.001

Abbreviations: DSHI: Deliberate Self-Harm or Ideation; MADRS: Montgomery-Åsberg Depression Rating Scale; BAS: Brief Anxiety Scale; BSI: Brief Symptom Inventory.

<sup>a</sup> p-value for trend by Kruskal Wallis or chi-squared test.

**Table 4.3.** Personality characteristics in total sample and according to the level of DSHI in 2,844 outpatients

	Total sample (n=2844, 100%)	Teriles of DSHI			p-value for trend <sup>a</sup>
		No DSHI (n=1295, 45.5%)	Intermediate DSHI (n=597, 21.0%)	High DSHI (n=952, 33.5%)	
Total DAPP-SF (mean ± SD)	2.5 ± 0.5	2.3 ± 0.5	2.6 ± 0.5	2.9 ± 0.5	<0.001
Personality Constructs (mean ± SD)					
Emotional dysregulation	2.7 ± 0.7	2.4 ± 0.7	2.8 ± 0.6	3.1 ± 0.6	<0.001
Dissocial behavior	1.9 ± 0.5	1.8 ± 0.5	1.9 ± 0.5	2.1 ± 0.6	<0.001
Inhibitedness	2.7 ± 0.7	2.6 ± 0.6	2.8 ± 0.6	3.0 ± 0.7	<0.001
Compulsivity	2.8 ± 0.9	2.7 ± 0.9	2.9 ± 0.9	2.9 ± 0.9	<0.001

Abbreviations: DSHI: Deliberate Self-Harm or Ideation; DAPP-SF: Dimensional Assessment of Personality Pathology -short form; Total DAPP-SF excludes the self-harm scale items.

<sup>a</sup> p-value for trend by Kruskal Wallis.

### Personality characteristics and DSHI

Table 4.3 shows personality characteristics according to the level of DSHI. Linear-by-linear associations revealed a significant increasing association of total DAPP-SF score from no DSHI, to intermediate and high DSHI,  $F(1, 2841) = 788.20$ ,  $p < 0.001$ . Significant increasing associations were also found for the personality constructs emotion dysregulation,  $F(1, 2841) = 786.99$ ,  $p < 0.001$ , dissocial behaviour,  $F(1, 2841) = 153.14$ ,  $p < 0.001$ , inhibitedness,  $F(1, 2841) = 164.68$ ,  $p < 0.001$  and compulsivity,  $F(1, 2841) = 27.12$ ,  $p < 0.001$ .

### Multivariable analysis

Table 4.4 presents the results of a multinomial logistic regression analysis. The overall model significantly predicted DSHI,  $R^2 = 0.35$  (Nagelkerke),  $\chi^2(28, 28) = 1056$ ,  $p < 0.001$ . A forward stepwise linear regression analyses revealed significant positive trends of DSHI for low education,  $\beta = 0.08$ ; unmarried or no partner,  $\beta = 0.05$ ; number of diagnoses,  $\beta = 0.07$ ; symptoms of anxiety,  $\beta = -0.27$ ; depressive symptoms,  $\beta = 0.39$ ; and emotion dysregulation,  $\beta = 0.36$ .

## Discussion

According to the findings of the present study, deliberate self harm and suicidal ideation are prevalent problems in psychiatric outpatients with MAS disorders, with 55% of the patients reporting thoughts or behaviours concerning deliberately injuring one's own body. This prevalence rate is comparable to previous studies among *depressed adolescent* outpatients where prevalence rates between 42% and 58% were found for any suicidality, including thoughts and behaviour (Tuisku et al., 2006; Pelkonen et al., 1997). This study

**Table 4.4.** Predictors of DSH in multinomial logistic regression analysis in 2,844 psychiatric outpatients

	Tertiles of DSH				t	Multivariable p-value for trend <sup>a</sup>	t	Forward stepwise analysis p-value for trend <sup>b</sup>
	No DSH (ref) (N=597)	Intermediate DSH (OR, 95% CI) (N=952)	High DSH (OR, 95% CI) (N=1295)	t				
Age	1.0	1.00 (0.99-1.01)	1.00 (0.99-1.01)	-0.33	0.74	-0.58	-	
Male sex	1.0	1.28 (1.02-1.61)	1.02 (0.81-1.28)	-0.70	0.48	-1.90	-	
Dutch background	1.0	0.80 (0.61-1.05)	0.94 (0.72-1.24)	0.35	0.72	-	-	
Married or partner	1.0	0.93 (0.75-1.15)	0.65 (0.52-0.80)	3.90	<0.001	4.69	<0.001	
High education	1.0	1.09 (0.88-1.35)	0.73 (0.59-0.90)	2.83	0.005	3.39	0.001	
Employed	1.0	0.87 (0.70-1.07)	0.73 (0.62-0.94)	2.50	0.012	-	-	
Number of diagnoses (MIN)	1.0	1.05 (0.94-0.17)	1.22 (1.09-1.36)	3.47	0.001	3.87	<0.001	
Symptoms of anxiety (BAS)	1.0	0.76 (0.65-0.90)	0.40 (0.34-0.47)	-11.75	<0.001	-11.87	<0.001	
General psychopathology (BSI)	1.0	1.20 (0.99-1.46)	1.20 (1.00-1.45)	2.25	0.025	-	-	
Depressive symptoms (MADRS)	1.0	1.35 (1.13-1.61)	3.13 (2.63-3.73)	13.73	<0.001	16.72	<0.001	
Emotion dysregulation (DAPP)	1.0	1.66 (1.41-1.96)	2.69 (2.27-3.19)	12.11	<0.001	19.58	<0.001	
Dissocial behavior (DAPP)	1.0	1.07 (0.94-1.22)	1.22 (1.08-1.38)	3.04	0.002	-	-	
Inhibition (DAPP)	1.0	1.08 (0.96-1.21)	1.12 (1.00-1.25)	1.84	0.07	-	-	
Compulsivity (DAPP)	1.0	0.96 (0.86-1.08)	0.95 (0.85-1.05)	-1.33	0.18	-	-	

Abbreviations: DSH: Deliberate self-Harm or Ideation; DAPP: Dimensional Assessment of Personality Pathology-Short Form; MADRS: Montgomery-Åsberg Depression Rating Scale; BAS: Brief Anxiety Scale; BSI: Brief Symptom Inventory; MINI: Mini International Neuropsychiatric Interview Plus; CI: Confidence Interval; OR: Odds Ratio; ORs are presented as z-scores.

<sup>a</sup> forced entry in multivariable linear regression;

<sup>b</sup> forward stepwise linear regression analysis;  $p=0.01$  for removal and  $p=0.005$  for entry.

confirmed the hypotheses that demographic factors, disease-related factors and general vulnerability factors are associated to DSHI in psychiatric outpatients with MAS disorders. We found that being unmarried, lower education, number of psychiatric diagnoses, lower anxiety scores, higher depression scores and emotional dysregulation were strong independent predictors of DSHI.

We found several factors associated to lifetime DSHI. First, sociodemographic factors such as being unmarried, unemployed and lower education were significantly related to the presence of DSHI in univariable analyses. In multivariable analyses, being unmarried and lower education were independent predictors of DSHI. These findings are comparable to previous research where social disadvantages such as no work and lower education are seen as risk factors for mental disorders and suicide attempts (Kapur et al., 2006; Taylor et al., 2004). A finding that contrasts with some earlier research is the lack of significant gender differences in the prevalence of DSHI (Herpertz, 1995). These results contribute to the discussion whether DSHI may be as common among men as it is among women (Muehlenkamp & Gutierrez, 2004).

Secondly, disease-related factors, specifically depressive and anxiety symptoms, general psychopathology, and number of diagnoses were positively associated with lifetime DSHI in univariable analyses. Consistent with previous research (Fliege et al., 2006) DSHI patients reported a higher degree of symptoms of depression, anxiety and general psychopathology (measured with the MADRS, BAS and BSI, respectively). In multivariable analyses, higher depression scores and number of diagnoses predicted DSHI. Surprisingly, when controlled for the other variables in the multivariable analysis, anxiety symptoms measured with the BAS showed an inverse association with DSHI. In previous research anxiety scales in the social phobia domain were related to lower levels of suicidal behaviour after controlling for depression and suicidal ideation (Valentiner et al., 2002). In another study nonattempters had significantly higher scores on anxiety than attempters of suicide (Placidi et al., 2000). In our sample, social phobia, posttraumatic stress disorder and obsessive compulsive disorder were more prevalent in the high DSHI group in univariable analyses, whereas panic disorder and generalised anxiety disorder were less prevalent in the high DSHI group. In this study, anxiety was measured with the BAS, a scale assessing mainly the somatic aspects of anxiety (Keedwell & Snaith, 1996). When corrected for depression in multivariable analyses, these somatic aspects of anxiety could be protective for DSHI. This is consistent with the finding that in our univariable analyses, the presence of a somatoform disorder showed a decreasing trend over the DSHI groups. Future research might examine whether this results can be replicated in other samples, and with other measures of anxiety.

Thirdly, with regard to general vulnerability factors, especially emotional dysregulation was strongly associated with lifetime DSHI, in both univariable and multivariable analyses. Several researchers claim that DSHI may in fact be an emotion regulation strategy itself, suggesting that DSHI patients have difficulties in coping with distress (Nock & Prinstein, 2004; Slee et al., 2008b) and that DSHI can be a way to avoid emotional problems (Slee et al., 2008a, b). Thereby, Brown et al. (2007) found that college-students with a past history of DSHI and with a recent history of DSHI both reported more negative emotions than the non-DSHI patients. This may indicate a general emotional vulnerability in patients with a history of DSHI.

### Strengths and limitations

Previous studies on prevalence and correlates of DSHI often focused on specific disorders (personality, anxiety or depressive disorders), or specific populations such as adolescents or inpatients. Strengths of this study are the large naturalistic psychiatric outpatient study population of 2,844 patients, the routinely adapted assessments by specifically trained research nurses and psychologists and the wide range of potential contributing factors assessed in the study, which focuses on current symptoms and disorders as well as on underlying vulnerabilities such as personality traits.

The study also has several potential limitations. First, not all referred MAS patients were assessed, because about 20% of all patients did not have a baseline ROM assessment due to language problems or logistical reasons. A second limitation includes the assessments of DSHI and personality traits. The DAPP-SF self-harm subscale measures lifetime suicidal ideation (4 items) and specifically self-poisoning and repetitive self-injury. Only two items specifically assess lifetime self-harming behaviour. According to previous research, specific deliberate self-harm behaviours (such as cutting, scratching or head banging) may be underreported according to self-report questionnaires unless they are specifically asked for (Gratz, 2001). Additionally personality traits were assessed by a self-report questionnaire. This may lead to bias such as social desirability and the predisposition to self-enhancement (Herpertz, 1995; Kocalevent et al., 2005; Paulhus & Vazire, 2007). Furthermore, the assessment of personality traits may be influenced by current symptoms of anxiety, depression and general psychopathology. Finally, in the current study, traumatic events were not assessed. Trauma was associated with deliberate self-harm behaviour and ideation in previous studies (Gratz et al., 2002; Romans et al., 1995).

In conclusion, with these results from psychiatric outpatients with MAS disorders about the factors associated with DSHI it may be easier to identify patients at risk for deliberate self-harm and suicide. The overall findings may implicate that interventions

for DSHI should not primarily focus on associated mental disorders such as depression, but should also focus on DSHI itself and specifically target emotion regulation strategies. Whether symptoms of somatic anxiety are protective should be confirmed in subsequent studies. Finally, the findings suggest that both present symptoms as well as underlying personality vulnerabilities seem to be involved in DSHI. Treatment should not merely focus on either personality pathology or for example depressive symptoms: an integrated approach seems more promising (Slee et al., 2008a, b; Slee et al., 2007; Weinberg et al., 2010). Specific therapeutic implications of these findings should be further studied.

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