

## NIGHTMARES AND SUICIDE: PREDICTING RISK IN DEPRESSION

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### SUMMARY

**Background:** There is growing evidence of an association of a number of subjective and objective sleep parameters (especially nightmares) and elevated suicidal risk in different clinical populations as well as in the general populations.

**Subjects and methods:** This is a cross-sectional naturalistic study of 52 inpatients (28 females and 24 males, aged from 24 to 75 years) meeting criteria for a current depressive episode within Recurrent Depressive Disorder (RDD) or Bipolar Disorder (BD) according to ICD-10. All patients were evaluated with the Hamilton Depression Rating Scale (HDRS), followed by a direct interview about their dreams' content and emotional charge, as well as about suicidal thoughts and plans or previous attempts.

**Results:** Patients with RDD suffered significantly more frequently from nightmares than those with BD,  $p < 0.05$ . Within the RDD group, experiencing nightmares was associated with significantly higher scores on the HDRS suicide risk item (2.36 vs 1.00), higher frequency of suicide attempts (35% vs 6%), and lower likelihood for lack of detectable suicide risk (21% vs 81%),  $p < 0.05$ . These differences were not explained by significant difference in the severity of depressive symptoms (28.00 vs 24.75,  $p = 0.16$ ). We were unable to detect such differences in the bipolar subgroup. No gender influences on the association of nightmares and suicidal risk were observed.

**Conclusions:** Depressed patients suffering from nightmares showed significantly higher suicide risk. Depression appeared to be a stronger risk factor for suicidal behavior when accompanied with nightmares. This was only valid for unipolar depression, while the results concerning bipolar depression were inconclusive.

**Key words:** depression – nightmares – suicide - suicide prevention

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### INTRODUCTION

Depression is a socially important illness worldwide and is one of the main risk factors for suicide (Mann et al. 2005). Up to 15% of those who are clinically depressed die from suicide (Bland 1997). Suicide is a leading cause of death worldwide – for 2008 it was the cause of 1.4% of deaths worldwide (782 000 people) (WHO 2012). Moreover, there are 20-30 times more suicide attempts than completed suicides (Goldney 2002). The burden of suicide is even larger as each suicide severely affects 5-6 other people (Goldney 2002).

In depression, all the basic instincts and drives are affected, including: self-preservation, sleep, appetite, thirst, sexuality, parental, social- and hierarchy-instincts. This study focused on the association between the first two.

Depressed patients suffer from significant sleep disruption: some have difficulty falling asleep but the

majority experience interrupted sleep, the most typical symptom being early morning awakening. Some of the patients also complain of intensively disturbing nightmares. Beyond these subjective complaints, there is also objective impairment in the architecture of sleep that can be measured by polysomnography (PSG) and EEG (Reynolds & Shipley 1985, Saletu et al. 2013). The most salient abnormality is a reduction in the duration of the period characterized primarily by delta oscillations ('delta sleep'). In addition, REM density is increased, which means that the percentage of the REM phases compared to the other phases of sleep is longer than normal. REM latency is also decreased – the first REM period begins earlier after falling asleep. Finally, the distribution of REM phases throughout the night is disturbed. Normally, REM phases increase in length and intensity in the course of the night, whereas in depressed patients this pattern is reversed (Reynolds & Shipley 1985).

Self-preservation is another key biological function affected by depression. Predicting suicide risk is one of the major challenges in everyday psychiatric practice. Previous suicide attempts are one of the best predictors for a future attempt (Sokero et al. 2005) and eventual death by suicide (Fawcett et al. 1990). However, studies show that only 30-42% of the completed suicides had been preceded by a previous suicide attempt (DeLong et al. 2010). Most people who attempt suicide suffer from a form of psychiatric disorder, although frequently this is not diagnosed at the time of the suicide attempt (Conwell & Henderson 1996, Mann et al. 2005). In summary, although a number of risk factors for suicide have been identified, reliable suicide prediction in an unmet need in psychiatric practice.

In recent years, there is growing evidence of an association of different subjective and objective sleep parameters and elevated suicidal risk. Several studies show an association between sleep duration and suicide risk, such as an association between insomnia and completed suicide (Fawcett et al. 1990, Goldstein et al. 2008), insomnia and lifetime suicide attempts in prisoners (Carli et al. 2011) and in the general population (Goodwin et al. 2008). Insomnia (Ağargün et al. 1997a, Chellappa & Araújo 2007, McCall et al. 2010) as well as hypersomnia (Ağargün et al. 1997a) were associated with suicidality in depressed patients. In patients with chronic pain early waking has been linked to increased suicidal ideation (Smith et al. 2004). In the general population decreased sleep duration is found to be associated with suicidal ideation both in adults (Blasco-Fontecilla et al. 2011, Wojnar et al. 2009, Goodwin et al. 2008, Krakow et al. 2011) and in adolescents (Choquet & Menke 1990, Liu & Buysse 2006, Goldstein et al. 2008). An association between subjective sleep quality and suicidality has also been demonstrated in depressed patients (Ağargün et al. 1997b), victims of sexual assault (Krakow et al. 2000) as well as the general population - elderly (Turvey et al. 2002) and middle-aged adults (Fujino et al. 2005). There are also studies showing associations of objective sleep measures and suicidal risk. For example, lower sleep efficiency and longer sleep latency were associated with suicide attempts in depressed patients (Sabo et al. 1991). Increased REM duration was associated with suicidal behavior in psychotic patients (Keshavan et al. 1994). Shorter REM latency, higher REM percentage and specific characteristics of the quality of REM were associated with suicidality in depressed patients (Ağargün & Cartwright 2003). The correlation of all these subjective and objective parameters and suicidal risk is somewhat confounded by the presence of depressive symptoms. Yet, there is growing evidence in different cultures and populations that nightmares are a separate marker for an elevation in the suicidal risk. However, the exact nature of this association is still unclarified (Bernert & Joiner 2007). An association was found between self-reported repetitive and frightening dreams and suicidality in

depressed patients in Turkey (Ağargün et al. 1998). In a prospective study in Finland, nightmare frequency at baseline predicted completed suicide, the relative risk being 57% and 105 % higher among those reporting respectively occasional and frequent nightmares (Tanskanen et al. 2001). An association between nightmares and suicidality, after controlling for depressive symptoms, is reported in psychiatric outpatients (Bernert et al. 2005), in suicide attempters (Sjöström et al. 2009) as well as in adolescents (Liu 2004, Nadorff et al. 2011). Melancholic patients with history of suicide showed higher rates of nightmares and insomnia symptoms compared to melancholic patients without a history of attempts (Ağargün et al. 2007). A study in Sweden demonstrated that nightmares were associated with 5-fold increase in suicide risk. This relationship remained significant after adjustment for psychiatric diagnoses and psychiatric symptom intensity (Sjöström et al. 2007). Some authors also suggest that the duration of sleep disturbances like insomnia and nightmares may be associated with an increase of the suicidal risk (Nadorff et al. 2013), which highlights the importance of addressing these problems in a timely fashion.

To the best of our knowledge, there have been no studies investigating sleep patterns and suicidal risk in bipolar depressed patients. This is relevant as it is still unclear whether different mechanisms underlie depression in the context of unipolar and bipolar disorders. Therefore, findings in unipolar depression should be generalized to bipolar patients with caution until the availability of direct evidence from bipolar disorder. In the present study we report results from a pilot group of bipolar depressed patients. The current study tested the hypothesis that nightmares are associated with an elevated suicidal risk in depressed patients.

## SUBJECTS AND METHODS

This is a cross-sectional naturalistic study of 52 inpatients (28 females and 24 males, aged from 24 to 75 years) meeting criteria for a current depressive episode within Recurrent Depressive Disorder/RDD (n=44) or Bipolar Disorder/BD (n=8) according to the ICD-10 (WHO 1993). The data was collected from February 2006 until April 2007. All patients were currently admitted for treatment of a depressive episode in one of four large psychiatric clinics in Sofia, Bulgaria (the psychiatric inpatient wards of the University Multi-profile Hospital for Active Treatment “Aleksandrovska”, the City Mental Health Centre, the Regional Mental Health Centre-Sofia and the Specialized University Hospital for Active Treatment in Neurology and Psychiatry “St. Naum”).

The psychiatric examination was performed by medical students through personal interviews with and observations of the patients. The research was preceded by five examinations of patients under the supervision of a qualified psychiatrist to ensure standardisation of the criteria among interviewers. The diagnoses were

made according to ICD-10 (WHO 1993), and patients were included if the diagnosis of the hospital chart was confirmed by check-list of the ICD-10 criteria for a current depressive episode. The level of current symptoms was assessed by the 21-item Hamilton Depression Rating Scale (HDRS) (Hedlund & Vieweg 1979). A direct interview about the frequency, content and emotional charge of patients' dreams was performed (Table 1).

**Table 1.** Questions about dreams

Do you remember dreaming?	yes/no
How often do you dream?	rarely/frequently/all the time
Dream intensity	low/medium/high (as real)
Emotional charge	pleasant/unpleasant/neutral
Self-reported association with medication	yes/no
Description of a representative dream	in patient's words

Based on the emotional charge of their dreams, the patients were divided into two groups: "with nightmares" (patients whose dreams were predominantly unpleasant) and "no nightmares" (patients who reported that having a nightmare was an exception or them and they were not troubled by such a problem; this includes neutral or positive emotional charge of the dreams). We did not differentiate between bad dreams and nightmares. Suicide risk was measured in item 3 (score 0 to 4) of HDRS. Number of past suicide attempts as well as current medication and subjective opinion of the patients for influence of medication on their dreams

were recorded for each interview. All participants included in the study completed an informed consent.

### Statistical analysis

The gathered data were processed with the statistical package SPSS 19.0, with non-parametric analyses (Mann-Whitney Test). The subgroups of RDD and BD patients were compared for severity of depression, suicidal risk variables and prevalence of nightmares and positive dreams. Comparisons between "with nightmares" and "no nightmares" were performed separately for the RDD and BD subgroups, with variables including total HDRS score, suicide HDRS item, history of suicide attempts, as well as a dichotomous variable (yes/no) of no detectable risk (no current suicidal ideation, no previous suicide attempts). A gender analysis comparing these variables, as well as the presence of nightmares, for males vs females in the whole group of depressed patients was also performed.

### RESULTS

The RDD and the BD subgroups did not differ significantly in the severity of their depression, as measured by HDRS. The two subgroups did not differ significantly in their suicide risk and the proportion of patients with past suicide attempts, as well as in the proportion of patients with no detectable suicide risk (Table 2). The only variable where there was a significant difference was the proportion of patients with troubling nightmares: 64% of the RDD patients had nightmares and only 25% of the BD patients ( $p < 0.05$ ) (Figure 2).

**Table 2.** Comparison between the RDD and the BD subgroups

	Suicide risk (HDRS item)	Suicide attempts, %	No suicide risk, %	Nightmares, %	Pleasant dreams, %	Depression, HDRS score
RDD (n=44)	1.86	25%	43%	64%	18%	26.82
BD (n=8)	2.25	38%	37%	25%	50%	22.13
	$p=0.557$	$p=0.468$	$p=0.767$	$p=0.044$	$p=0.052$	$p=0.110$

RDD=recurrent depressive disorder; BD=bipolar disorder; HDRS=Hamilton Depression Rating Scale

**Table 3.** Statistical significance of the differences between subjects with and without nightmares in the RDD and BD subgroups

	Suicide risk (HDRS item)	Suicide attempts, %	No suicide risk, %	Depression, HDRS score
"Nightmares" vs "No nightmares" in RDD	2,36 vs 1.00 $p=0.004$	35% vs 6% $p=0.032$	21% vs 81% $p < 0.001$	28.00 vs 24.75 $p=0.164$
"Nightmares" vs "No nightmares" in BD	3.00 vs 2.00 $p=0.643$	50% vs 33% $p=0.857$	0% vs 50% $p=0.429$	24.50 vs 21.33 $p=0.429$

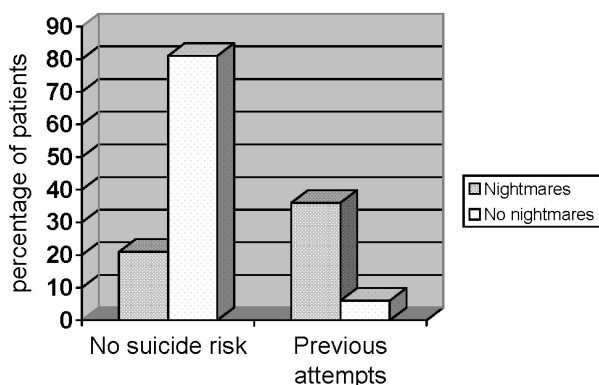
RDD=recurrent depressive disorder; BD=bipolar disorder; HDRS=Hamilton Depression Rating Scale

**Table 4.** Differences between female and male subjects

	Suicide risk (HDRS item)	Suicide attempts, %	No suicide risk, %	Nightmares, %	Pleasant dreams, %	Depression, HDRS score
Females (n=28)	2.14	29%	39%	64%	27.68	2.14
Males (n=24)	1.67	25%	46%	50%	24.25	1.67
	$p=0.227$	$p=0.774$	$p=0.637$	$p=0.303$	$p=0.106$	$p=0.227$

HDRS=Hamilton Depression Rating Scale

In the RDD subgroup, the patients with nightmares had significantly higher average score on the HDRS item on suicide risk (2.36) than those without nightmares (1.00),  $p < 0.005$ . They had history of suicide attempts significantly more frequently - in 35% of the cases, while there was such history in only 6% of those without nightmares ( $p < 0.05$ ) (Figure 1). Besides, there was a significantly smaller proportion of patients with no detectable suicide risk - 1 in 5 patients, while 4 in each 5 patients without nightmares had no detectable suicide risk ( $p < 0.001$ ) (Figure 1).

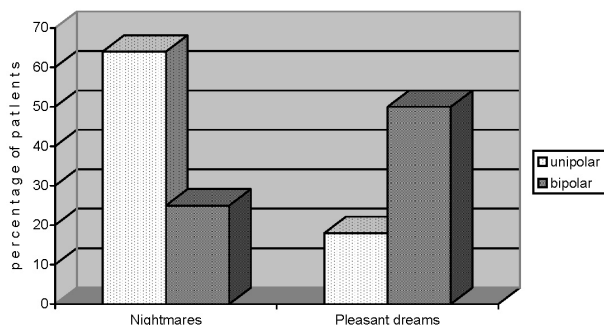


**Figure 1.** Percentage of patients with suicide risk and previous suicide attempts among RDD depressed patients with and without nightmares

In the bipolar group, we were unable to detect differences in the suicide risk variables between the patients with nightmares and those without (Table 3).

No significant difference in the severity of depression, suicide risk and presence of nightmares was detected between the two genders (Table 4).

An interesting finding was that there were patients ( $n=12$ , 23%) who reported that they had predominantly pleasant dreams, even though they were in a severe depression. There were many more subjects with bipolar depression who reported having pleasant dreams, although this difference was not found to be significant (Table 2, Figure 2).



**Figure 2.** Nightmares and pleasant dreams among patients with unipolar and bipolar depression

Only 4 (7.7%) patients declared subjective feeling of influence of their medication on their dreams, and three of them declared an impression that since they are

taking an exact medication (one – a benzodiazepine, one – carbamazepine, and one – chlorazine), they cannot remember their dreams; one patient declared that his medication (olanzapine) has influenced his dreams, and he was having pleasant dreams with everyday life content.

## DISCUSSION

The study has several limitations. Firstly, the number of the subjects is relatively small, especially for the bipolar subgroup. Secondly, the study uses a retrospective design, which bears the risk of recall bias. However, one can argue that this is the type of information used in everyday clinical practice when making decisions regarding suicide risk. Thirdly, it is unclear whether medication exercised a significant confounding effect. We collected information on medication but it was too heterogeneous to allow reliable confounding analysis. However, the subjective opinion of 92.3% of the patients was that there was no detectable influence of their medication on the emotional charge, intensity and content of their dreams.

Despite the abovementioned shortcomings, we found that RDD patients with nightmares had statistically significantly increased suicide risk, measured both by the current suicidal ideation and by the history of previous lifetime suicide attempts. Besides, the demonstrated association between nightmares and suicide risk is in line with the previously published literature (Ağargün et al. 1998, Tanskanen et al. 2001, Bernert et al. 2005, Liu 2004, Curkovic et al. 2006, Ağargün et al. 2007, Sjöström et al. 2007, Krakow et al. 2011, Nadorff et al. 2011).

An interesting finding was that there were patients who reported that they had predominantly pleasant dreams, even though they were in a severe depression. This is convincing evidence that depression and nightmares do not always come together and they can be viewed as independent risk factors. In the context of growing evidence for differences in the sleep-wake cycle and melatonin regulation of bipolar and unipolar depressed patients (Lam et al. 1990, Nurnberger et al. 2000, Robillard et al. 2013). It is important to note that this phenomenon of pleasant dreams was observed much more frequently, though not statistically significantly, in bipolar depression than in RDD (Table 2, Figure 2). This issue needs further investigation, because if such tendency proves significant, asking about nightmares and pleasant dreams may be helpful in another problematic area beside suicidal prevention – distinguishing between unipolar and bipolar disorder.

It has to be noted that we did not detect a difference between subjects with and without nightmares in the bipolar group. However, the sample size was very small which renders the finding inconclusive. On the other hand, this finding may correspond to the fact that thoughts of suicide are not always present when the person is at risk for suicide. Most often, risk for suicide

is measured by having thoughts or plans or previous suicidal actions, and HDRS depicts exactly this type of assessment of the risk. Yet, recent studies reveal that patients sometimes report suicidal imagery without having suicidal thoughts and that proneness to imagery was even more common in patients with bipolar disorder (Crane et al. 2012, Hales et al. 2011). Unfortunately, this aspect was not investigated in this study, and we did not ask the patients about having mental imagery of suicides while they are awake. A future intention of our group is to replicate this study in a larger group of depressed bipolar patients.

## CONCLUSION

Depressed patients suffering from nightmares showed significantly higher suicide risk. Depression appeared to be a stronger risk factor for suicidal behavior when accompanied with nightmares. This was only valid for unipolar depression, while the results concerning bipolar depression were inconclusive.

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**Conflict of interest:** None to declare.

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