Nightmare distress, beliefs about nightmares, and waking-life anxiety

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Summary. For the diagnosis of a nightmare disorder, the person should report clinically significant distress due to nightmares. Thus, research should focus on understanding the factors that might contribute to nightmare distress – in addition to the most obvious one, nightmare frequency. Overall, 285 persons (221 women, 60 men, 4 non-binary persons) with a mean age of 24.00 ± 5.51 years participated in the study. The findings of the present study indicated – as expected – that beliefs about nightmares, gender, and anxiety contribute independently – in addition to nightmare frequency – to nightmare distress. Identifying factors that are associated with being vulnerable to nightmare distress, can inform clinicians to better diagnose and treat persons who suffer from nightmares.

Keywords: Nightmare distress, Beliefs about nightmares, anxiety, gender differences

1. Introduction

For diagnosing a nightmare disorder, the patient has to report clinically significant distress due to nightmare with typical symptoms like mood disturbance during the day, sleep resistance (bedtime fear), intrusive nightmare imagery during the day (American Academy of Sleep Medicine, 2014). In the DSM-5 (American Psychiatric Association, 2013), the severity of the nightmare disorder is categorized into three groups: mild (less than one episode per week on average), moderate (one or more episodes per week but less than nightly), and severe (episodes nightly). Given that distress is the essential diagnostic criteria, using cut-offs based nightmare frequency seems non-intuitive. Similar, etiological models of nightmares (Gieselmann et al., 2019; Levin & Nielsen, 2007; Schredl, 2023) generally focus on explaining inter-individual differences in nightmare frequency. Even though, this makes sense as nightmare frequency is highly correlated with nightmare distress (Belicki, 1992; Kelly & Mathe, 2024; Schredl & Göritz, 2019; Schredl et al., 2021), the question remains whether other variables might also contribute to nightmare distress – in addition to nightmare frequency. The interest in studying nightmare distress was stimulated by Belicki (1992) who reported that nightmare distress was much stronger associated with psychopathology measures compared to nightmare frequency – a finding that was confirmed by Levin and Fireman (2002). However, these studies did not use detailed regression analyses in order to differentiate between the indirect effect of a variable on nightmare distress mediated via nightmare frequency and direct effects on nightmare distress that are independent of nightmare frequency. The overview below illustrated why this is of importance.

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Interestingly, several factors that are associated with nightmare frequency can also increase nightmare distress if nightmare frequency is statistically controlled. The first factor is gender: Women tend to report higher nightmare frequencies compared to men (Schredl & Reinhard, 2011) but also reported higher nightmare distress if nightmare frequency was statistically controlled for (Schredl et al., 2014). This finding implies that women are more vulnerable to distress associated with nightmares than men. Similar, neuroticism that is associated with nightmare frequency (Roland & Goossens, 2025) also contributes independently of the nightmare frequency neuroticism path to nightmare distress (Schredl & Göritz, 2019; Schredl et al., 2021). This seems plausible, as persons who worry a lot in waking life (Shiraev, 2017) are more easily stressed by nightmares compared to persons who are emotionally stable. State anxiety measured with the Depression Anxiety Stress Scales (DASS) anxiety scale also showed – in addition to the association with nightmare frequency – an additional effect on nightmare distress (Remedios et al., 2023). The finding that emotion dysregulation (Kelly & Mathe, 2024) and rumination (Wang et al., 2024) is associated with nightmare distress would fit in this line of thinking.

Schredl et al. (2019) investigated whether specific beliefs about nightmares, e. g., "Nightmares contain clues to unconscious fears" or "Nightmares predict the future" contribute independently to nightmare distress. The underlying theory was that nightmares can be more distressing if the person attributed links to waking life or even consequences in waking life to nightmares, e.g., "There might something wrong with me if I have frequent nightmares" or "Something bad will happen to me." This is somewhat in contrast with the disposition-stress model of nightmares (Schredl, 2023) stating that specific dispositions like thin boundaries (persons who are creative and sensitive) and neuroticism and current stressors are related with higher nightmare frequencies. After controlling for nightmare frequency, the 6-item beliefs about nightmares scale (BANS) was related to neuroticism, indicating that these beliefs might be dysfunctional (Schredl, 2021). But, it was also related to openness to experience (which included the thin boundary concept) showing that there might be a complex interplay between

disposition, nightmare frequency, beliefs about nightmares and nightmare distress (Schredl, 2021). The beliefs about nightmares scale (BANS) contributed – as expected – considerably to nightmare distress – again after controlling for nightmare frequency (Schredl et al., 2019). Even after controlling for gender and neuroticism, beliefs about nightmares still contributed significantly to nightmare distress (Schredl, 2021). Overall, these findings indicate that not only nightmare frequency is a factor in explaining inter-individual differences in nightmare distress but other factors like gender, neuroticism, and beliefs about nightmares play an additional role.

So far, the influence of the BANS on nightmare distress was studied only in one sample (Schredl et al., 2019), thus, the aim of this study was to corroborate the previous finding that beliefs about nightmares contribute to nightmare distress in addition to nightmare frequency, gender, and neuroticism.

2. Method

2.1. Participants

Overall, 285 persons (221 women, 60 men, 4 non-binary persons) completed the online survey. The mean age of the sample was 24.00 ± 7.51 years (range: 18 to 72 years). The vast majority of the participants were students.

2.2. Research Instruments

For eliciting nightmare frequency, an eight-point rating scale ("How often did you experience nightmares recently (in the past several months)?") 0 = never, 1 = less than once a year, 2 = about once a year, 3 = about two to four times a year, 4 = about once a month, 5 = two to three times a month, 6 = about once a week, 7 = several times a week) was applied (Schredl et al., 2014). The question included the following definition: "Nightmares are dreams with strong negative emotions that result in awakening from the dreams. The dream plot can be recalled very vividly upon awakening." The retest reliability of this scale was r = .765 (two-week interval; Schredl et al., 2014). Nightmare distress was measured by using a five-point scale "If you currently experience nightmares, how distressing are the nightmares?" (0 = Not at all distressing, 1 = Not that distressing, 2 = Somewhat distressing, 3 = Quite distressing, and 4 = Very distressing). Retest reliability for a two-week interval was r = .673 (Schredl et al., 2014).

The Beliefs about Nightmares Scale (BANS) consists of six five-point items coded as 0 = Not at all, 1 = Not that

much, 2 = partly, 3 = Somewhat, and 4 = Totally: "Nightmares process negative events.", "Nightmares contain clues to unconscious fears.", "Anyone who regularly has nightmares has experienced something bad in the past.", "Some nightmares can become reality.", "Nightmares can contain important messages.", and "Nightmares predict the future." (Schredl et al., 2019). The BANS score is computed as mean of these six items and showed high internal consistency (Cronbach's alpha = .784) (Schredl et al., 2019).

Participants completed the 7 items of the German version of the Depression-Anxiety-Stress-Scale (DASS-21) (Nilges & Essau, 2021); for the original scale see: Lovibond and Lovibond (1995). The items (e.g., "I felt scared without any good reason") followed a four-point format: 0 = "Did not apply to me at all", 1 = "Applied to me to a certain extent or sometimes", 2 = "Applied to me to a considerable extent or quite often", and 3 = "Applied to me very much or most of the time." The total score is derived by adding up the item scores. This German version of the DASS showed high internal consistency (Cronbach's alpha) for the anxiety subscale, ranging from .76 to .82 in four different samples (Nilges & Essau, 2015).

2.3. Procedure

Study participants, mainly cognitive science and psychology students at the University of Osnabrück, were recruited by distributing the link for the online questionnaire via email and social media by the second author. The survey was online between February 28th, 2024 to March, 26, 2024.

Statistical procedures were carried out with the SAS 9.4 software package for Windows. Ordinal regressions were used for analyzing nightmare frequency and nightmare distress whereas parametric regressions were used for the BANS score. All variables were entered simultaneously. The SAS "Logistic" procedure provides an adjusted pseudo-R^2 according to Nagelkerke which is roughly comparable to R^2 in parametric regressions. Effect sizes for different predictors of the ordinal regressions were computed based on chi-square values and total N according to formula given in Cohen (1988) using the website of Lenhard and Lenhard (2016). The effect sizes for the parametric regression were computed based on the assumption that standardized regression coefficients are good proxies for correlations coefficients (Peterson & Brown, 2005).

3. Results

The nightmare frequency distribution is depicted in Table 1. About 22% of the participants reported that they had night-

Table 1. Nightmare frequency (N = 285).

Topic	Frequency	Percentage
Several times a week	28	9.82%
About once a week	35	12.28%
two or three times a month	64	22.46%
About once a month	61	21.40%
About two or four times a year	52	18.25%
About once a year	20	7.02%
Less than once a year	18	6.32%
Never	7	2.46%

Table 2. Beliefs about Nightmares Scale (BANS) items (N = 285).

Item	Mean ± SD
Nightmares process negative events.	2.18 ± 0.99
Nightmares contain clues to unconscious fears.	2.77 ± 0.87
Anyone who regularly has nightmares has experienced something bad in the past.	1.88 ± 0.97
Some nightmares can become reality.	1.51 ± 0.97
Nightmares can contain important messages.	2.00 ± 1.01
Nightmares predict the future.	0.40 ± 0.61

Table 3. Ordinal regression analysis for nightmare frequency and parametric regression for the beliefs about nightmares scale (BANS).

Item	Nightmare frequency				Beliefs about nightmares scale			
	SE	χ^2	p	d	SE	t	p	d
Age	-.0686	1.4	.2428	-0.142	.0351	0.6	.5415	0.070
Gender	.2332	14.9	.0001[1]	0.473	.2468	4.2	<.0001	0.509
Anxiety (DASS)	.2646	18.6	<.0001[1]	0.533	.2131	3.6	.0004	0.413
Nightmare frequency					-.0533	-0.5	.3831	-0.107
	N = 281, R² = .1418				N = 281, R² = .0983			

SE = Standardized estimates, d = Effect size, [1]one-tailed

mares at least once a week whereas only 2.5% reported that they experienced no nightmares. Compared to a German representative sample (Schredl, 2013), the difference was significant (standardized estimate: .5202, χ^2 = 191.3, p < .0001, effect size: 0.873; ordinal regression analysis controlled for age and gender). The mean of the Beliefs about Nightmare Scale (BANS) score was 1.79 ± 0.51. The internal consistency (Cronbach's alpha) was r =.578. The highest mean was found for the BANS item "Nightmares contain clues to unconscious fears" whereas "Nightmares predict the future" showed the lowest mean (see Table 2).

The mean and standard deviation of the DASS anxiety scale were 4.82 ± 4.15 with an internal consistency (Cronbach's alpha) of r = .812.

The ordinal regression for nightmare frequency indicated that women tended to report more nightmares than men and that the DASS anxiety scale was related to nightmare frequency (see Table 3). The BANS score was associated with gender (women showed higher scores) and anxiety but not with age or nightmare frequency (see Table 3).

For the participants who reported having nightmares (N = 278), nightmare distress was distributed as follows: Very distressing (3.60%), Quite distressing (13.67%), Somewhat distressing (35.97%), Not that distressing (31.65%), and Not at all distressing (15.11%). Nightmare frequency was – as expected – the major factor associated with nightmare distress (see Table 4). Also in line with the hypotheses, female gender and the DASS anxiety scale were associated with increased nightmare distress. Adding the Beliefs about Nightmares Scale (BANS) score showed an independent contribution to nightmare distress in addition to night-

mare frequency, gender, and the DASS anxiety scale (see Table 4).

Given that Cronbach's alpha is quite low (cf. Taber, 2018), exploratory analyses were carried out to test how strong the associations between the single BANS items and nightmare distress were – while controlling for age, gender, nightmare frequency, and the DASS anxiety scale (similar to the analyses presented in Table 4). The strongest effects were found for the items "Nightmares predict the future" and "Nightmares can contain important messages" whereas the items "Some nightmares can become reality" and "Nightmares contain clues to unconscious fears" showed no significant association with nightmare distress and very small effect sizes (see Table 5). The remanding two items are somewhat in-between.

In Table 6, the results of the exploratory factor analysis are depicted. The two-factor solution explained 50.83% of the total variance. After Varimax rotation, Factor 1 explained 25.84% of the total variance, Factor 2 explained 24.99%. Whereas the second factor (nightmares relate to the future, this is has consequences in waking life) might be a sub-facet of the general beliefs about nightmares construct, a factor with the items "Nightmares process negative events", "Nightmares contain clues to unconscious fears" and "Nightmares can contain important messages" are not that intuitive on a theoretical level. Moreover, the item "Anyone who regularly has nightmares has experienced something bad in the past" did not load substantially on any of the two factors.

Table 4. Ordinal regression analysis for nightmare distress.

Item	Analysis 1				Analysis 2			
	SE	χ^2	p	d	SE	χ^2	p	d
Age	.0241	1.4	.7019	0.038	.0103	0.0	.8706	0.021
Gender	.1613	6.0	.0071[1]	0.299	.1220	3.2	.0359[1]	0.217
Nightmare frequency	.4926	46.1	<.0001[1]	0.900	.5094	48.3	<.0001[1]	0.925
Anxiety (DASS)	.2193	10.8	<.0005[1]	0.405	.1736	6.5	.0059[1]	0.312
Belief about nightmares (BANS)					.1893	8.0	.0024[1]	0.347
	N = 274, R² = .3073				N = 274, R² = .3285			

SE = Standardized estimates, d = Effect size, [1]one-tailed

Table 5. Ordinal regression analyses for nightmare distress for the six BANS items controlling for age, gender, nightmare frequency, and DASS anxiety.

Item	SE	χ^2	p	d
Nightmares process negative events.	.0963	2.2	.0679	0.180
Nightmares contain clues to unconscious fears.	.0626	1.0	.1645	0.121
Anyone who regularly has nightmares has experienced something bad in the past.	.0915	2.1	.0753	0.176
Some nightmares can become reality.	.0342	0.3	.2934	0.066
Nightmares can contain important messages.	.1393	4.7	.0155	0.264
Nightmares predict the future.	.1818	8.0	.0024	0.347

SE = Standardized estimates, d = Effect size, all p values are one-tailed

4. Discussion

The present findings corroborate the previous findings (Schredl, 2021; Schredl et al., 2021) that beliefs about nightmares, gender, and anxiety (as a proxy for neuroticism) contributes to nightmare distress. However, the reliability of the BANS scale in this sample was relatively low and the subsequent exploratory analyses indicate that beliefs like "Nightmares predict the future" or "Nightmares can contain important messages" might be more tightly associated with nightmare distress than other beliefs like "Nightmares contain clues to unconscious fears."

First, several methodological issues need to be discussed. The present sample was a convenience sample, that is, participants with nightmares were more likely to participate. The large effect size of the comparison to a representative sample of German citizens is evidence of that. On the other hand, relationships between variables like gender, anxiety levels, and nightmare frequency were in line with previous studies (Remedios et al., 2023; Schredl & Reinhard, 2011) supporting the validity of the other regression analytic findings reported in the present study. In contrast to the previous study (Schredl, 2021), a scale measuring anxiety symptoms occurring over the past week was used – instead of the more trait like measure of neuroticism. However, research (Regzedmaa et al., 2023) indicate that state anxiety measures are highly correlated with neuroticism; thus, the finding that the DASS anxiety scale showed similar correlations like neuroticism to nightmare frequency, nightmare distress, and beliefs about nightmares is plausible.

The internal consistency of the 6-item Beliefs About Nightmare Scale (BANS) was considerably lower compared to the original publication of Schredl et al. (2019): rtt = .578 vs. rtt = .784). This raises the question whether the construct "beliefs about nightmares" is one-dimensional. The exploratory factor analysis provided clues that beliefs about nightmares might consists of different – relatively independent – facets. On the other hand, the small sample size compared to the original study of Schredl et al. (2019) and the specific sample characteristics (biased toward persons with frequent nightmares) are factors that suggest carrying out a new study starting again with a large variety of beliefs about nightmares would be advisable.

Interestingly, the BANS score was related to gender and anxiety – assuming that the anxiety score is closed related to neuroticism –in a similar way compared to the previous study looking at the personality correlate of the BANS (Schredl, 2021). In view of these associations, it would be very interesting to study how such beliefs might form in the course of person's life.

Like in the previous study (Schredl et al., 2019), adding the BANS scale increased the percentage of explained variance. Taken together, nightmare frequency, gender, anxiety, and beliefs about nightmares contributed independently to nightmare distress. This indicates that looking just at nightmare frequency (see severity grouping of the DSM-5 diagnosis of the nightmare disorder) might not be enough to classify nightmare disorder severity, as some persons might be more vulnerable to suffer from nightmares than others – irrespective of their nightmare frequency. The high prevalence of nightmare disorders and/or frequent nightmares in patients with mental disorders (Schredl et al., 2024; Swart et al., 2013; van Schagen et al., 2017) supports the notion that persons who already struggle with symptoms like depression, anxiety in their waking life are more likely to be stressed by additionally having nightmares. Some clinicians recommend nightmare treatment techniques as add-on to

Table 6. Exploratory factor analysis for the six items of the BANS scale.

Item	Factor 1	Factor 2
Nightmares process negative events.	.776	-.087
Nightmares contain clues to unconscious fears.	.748	.192
Anyone who regularly has nightmares has experienced something bad in the past.	.113	.399
Some nightmares can become reality.	-.064	.730
Nightmares can contain important messages.	.590	.465
Nightmares predict the future.	.160	.739

Note. Selection criterion: Eigen values > 1, Varimax rotation

common treatments of mental disorders (Ellis et al., 2019; van Schagen et al., 2015).

Interestingly, women tend to report higher nightmare distress than men even though nightmare frequency, neuroticism, and beliefs about nightmares are statistically controlled and, thus, this finding replicates the results of Schredl (2021). Controlling for these variables is important as women tend to report more frequent nightmares (Schredl & Reinhard, 2011), tend to score higher on neuroticism (Lynn & Martin, 1997) and also score higher on the belief about nightmare scale (Schredl et al., 2019). One possible explanation of this still significant gender effect might be the feminine sex role orientation as this construct was related to nightmare frequency especially in women (Schredl & Göritz, 2021). Nevertheless, future research might help to identify other factors that are associated with the gender difference in nightmare distress.

The finding that the BANS item "Nightmares predict the future" showing the strongest association with nightmare distress fits in with the case of a young man reported by Schredl et al. (2019): He developed a clinically significant anxiety disorder after having an exceptional vivid nightmare of being shot – as he believed this nightmare will come true. Interestingly, the percentage of participants reporting of having had a precognitive dream is relatively high, 17.8% to 38.0% in large-scaled samples (see review: Schredl, 2009) and even up to 50% in student samples (Schredl, 1998-1999). Thus, the percentage of about 34% of participants of the present study stating that they share at least somewhat the belief that nightmares predict the future would be consistent with the figures of having precognitive dreams. It would be interesting to study whether having already experienced a bad precognitive dream might contribute to develop this specific belief about nightmares that in turn can contribute to nightmare distress.

To summarize, the findings of the present study indicate that an etiological model of nightmare disorder should not only focus on nightmare frequency alone but also include factors that contribute independently to nightmare distress like gender, neuroticism/anxiety, and belief about nightmares. Identifying these factors, can inform clinicians to better diagnose and treat persons who suffer from nightmares.

AI Statement

No AI tools or AI assistants were used for creating this article.

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