A brief measure of posttraumatic nightmares

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Summary. Previous research on nightmares rarely distinguished between posttraumatic and idiopathic nightmares perhaps due to a lack of efficient, psychometrically sound self-report measures. The current study describes the development and preliminary examination of the Posttraumatic Nightmare Index (PTNI), a brief measure to assess the incidence of posttraumatic nightmares. In a sample of 135 university students the scale possessed adequate internal consistency reliability and a unidimensional factor structure. Convergent validity was supported through significant positive correlations with nightmare frequency, nightmare distress, general psychological distress, and posttraumatic stress symptoms. Incremental validity was supported by the PTNI's ability to uniquely predict trauma symptoms after accounting for nightmare frequency and nightmare frequency after controlling for trauma symptoms. The scale was found to account for its own unique variance after controlling general nightmare frequency. The results and areas for future research were discussed.

Keywords: Nightmares, Posttraumatic Stress Disorder, Nightmare Distress, Psychological Distress

1. Introduction

Nightmares, easily remembered dysphoric dreams that often awaken the sleeper (American Psychiatric Association, 2013), can be categorized as either posttraumatic nightmares (PTNM's), those referencing or replicating a traumatic event, or idiopathic, those manifestly unrelated to any particular traumatic event (Levin & Nielsen, 2007; Spoormaker, Schredl, & van den Bout, 2006). Despite cautions that researchers should distinguish PTNM's and idiopathic nightmares (i.e., Levin & Nielsen), most studies examine nightmare frequency as a general experience regardless of whether they are trauma-related. Consistently ignoring this distinction makes understanding the two forms of nightmares, their similarities and differences, and potentially distinct mechanisms difficult.

Perhaps one issue that has slowed research comparing PTNM's and idiopathic nightmares is the paucity of psychometrically sound self-report measures available for researchers. One instrument, the Trauma-Related Nightmare Survey (TRNS; Cranston, Miller, Davis, & Rhudy, 2017; Davis, Wright, & Borntrager, 2001) includes 16 items, though only two directly assess PTNM's. Schreuder, van Egmond, Kleijn, and Visser (1998) propose the 9-item Nocturnal Intrusions of Traumatic Events Questionnaire (NITE). The NITE allows a more detailed understanding of the context and experience of trauma-related nightmares including categorization of PTNM's as replicative (closely replicates a traumatic event), symbolic (reflects some traumatic event elements but less replicative), or mixed (a combination of replicative and symbolic) (Schreuder, Igreja, van Dijk, & Kleijn, 2001). Though both the TRNS and NITE have clinical relevance they also have psychometric limitations problematic for re-

search purposes. For instance, neither have consistent response scales across items. Therefore, it is difficult using these instruments to collect meaningful internal consistency reliability or use cohesive total scale scores to assess the experience of PTNM's.

The purpose of the current study was to develop a psychometrically sound, brief measure for researchers interested in sampling the general experience of PNTM's among nonclinical samples, but not needing to identify a specific type (i.e., replicative or symbolic). In addition to describing the development of the scale, the current study sought to examine preliminary evidence of the scale's reliability and validity. It was expected, based on previous findings that the scale would exhibit significant positive correlations with measures with which it rationally should relate to indicate convergent validity. Specifically, given that general reports of nightmare frequency increase following trauma exposure (Wood, Bootzin, Rosenhan, Nolen-Hoeksema, & Jourden, 1992), significant positive correlations were expected between PTNM's and general nightmare frequency. From findings that waking distress about nightmares was higher for traumatized patients than nontraumatized individuals (Germain & Nielsen, 2003), it was expected that PTNM's would significantly positively correlate with nightmare distress. Based on numerous previous findings that PTNM's were related to PTSD symptoms (de Dassel et al., Gorzka, 2018; Gray & Cromer, 2018; Wittmann et al., 2010), it was expected that the new PTNM measure would significantly positively relate to PTSD symptoms. Finally, given findings that individuals with PTNM's had higher scores on measures of general psychological distress (Schreuder, Kleijn, & Rooijmans, 2000), it was expected that the new measure of PTNM's would significantly positively relate to general psychological distress.

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2. Method

2.1. Participants and Procedure

Participants included 135 (79 males) students enrolled in undergraduate psychology courses at a small university in

the United States. The average age of the sample was 19.53 years (SD=2.47).

2.2. Measures

Posttraumatic Nightmares Index (PTNI). Initially five items were developed to assess the general experience of PT-NM's. Two items were deleted after pilot work revealed low item-total correlations. Therefore, three items were retained for the current study. Item content primarily tapped replication and association of traumatic events to PTNM's. The term "stressful experience" rather than trauma was used to be consistent with contemporary trauma-related measures (i.e., Weathers, Litz, Herman, Huska, & Keane, 1993). For ease of reference the scale was termed the Posttraumatic Nightmares Index (PTNI). Item content for the PTNI was presented in Table 1. Participants responded using a 5-point response scale (1="Strongly Disagree" to 5="Strongly Agree"). Responses were summed to produce a total PTNI score; higher scores indicated more PTNM's. Based on previous suggestions (Schredl, 2013) participants were instructed that "nightmares are dreams with strong negative emotions that usually result in waking from the dream. The plot can be remembered clearly after waking."

Nightmare Frequency Questionnaire, Modified (NFQ-M). Nightmare frequency was measured using a two-item version of the Nightmare Frequency Questionnaire (Krakow et al., 2002). For the current study, the NFQ was modified from its original format by asking participants to provide retrospective estimates of the number of nights they had nightmares and the number of nightmares experienced over the past week. Responses were summed to produce a total nightmare frequency score; higher scores indicated more frequent nightmares.

Nightmare Distress Questionnaire (NDQ). The 13-item NDQ (Belicki, 1992) assessed nightmare distress, waking suffering associated with nightmares. Participants responded using a 5-point scale (1="Strongly Disagree" to 5="Strongly Agree"). A sample item was "Do nightmares affect your well-being?" Responses were summed to produce a total NDQ score; higher scores indicted more nightmare distress.

Symptom Checklist-10R (SCL-10R). Psychological distress was measured with the 10-item short form of the Symptom Checklist 90-Revised (Rosen et al., 2000). Participants indicated the extent to which they had been bothered by various distress symptoms over the past week using a 5-point scale (0="Not at all" to 4="Extremely"). A sample item was "Feeling tense or keyed up." Responses were summed to produce a general psychological distress score; higher scores reflected more distress.

PTSD Checklist-Civilian Version, 6 Item (PCL-SF). Posttraumatic symptoms were measured using the 6-item short form of the PTSD Checklist-Civilian Version (Lang & Stein, 2005). Participants reported how much they had been bothered by trauma symptoms using 5-point scale (1="Not at all" to 5="Extremely"). A sample item was "Repeated, disturbing memories, thoughts, or images of a stressful experience from the past?" Responses were summed to produce a total score; higher scores indicated more posttraumatic symptoms. No PCL-SF item referenced dreams or nightmares. Lang and Stein suggested a cut-score of 14 as indicative of possible PTSD. In the current sample, 36% of participants exceeded this criteria.

2.3. Procedure

Participants were recruited before undergraduate psychology courses to complete a questionnaire on "Nightmares, Personality, and Stress." After providing informed consent, participants completed anonymous paper and pencil questionnaires during regular class times. No time limit was provided for completing questionnaires. No exclusionary criteria were used for participants and all data were included in analyses.

2.4. Statistical Analysis

Coefficient alpha was used to determine the reliability of scales. A principle components factor analysis was calculated to determine the factor structure of PTNI items. Pearson correlations were calculated to examine relationships between all variables (convergent validity). Linear regressions were calculated to examine the contribution of PTNI scores to trauma symptoms above nightmare frequency and to nightmare frequency above trauma symptoms (incremental validity). Partial correlations were calculated to allow comparisons of relationships between PTNMs and idiopathic nightmares with other variables. All analyses were conducted using SPSS for Windows.

3. Results

3.1. Factorial Validity

Responses to PTNI items were subjected to a principle components factor analysis. One factor with an Eigenvalue greater than 1 (Eigenvalue = 2.03) was extracted which accounted for 67.41% of the variance in responses. Factor loadings for items were presented in Table 1.

3.2. PTNI Scale Properties

The coefficient alpha reliability, average total score, and standard deviation of the PTNI were presented in Table 2. The median PTNI score was 4.0. As seen in the table, the coefficient alpha was adequate for a brief research scale. PTNI scores were not significantly correlated with age, r=-.04, p=.69, and there were no significant gender differences, t(133)=1.31, p=.19.

3.3. Convergent Validity

Correlations between all variables were presented in Table 2. Higher PTNI scores were significantly related with more nightmare frequency, nightmare distress, general psychological distress, and posttraumatic symptoms. The strongest correlate for the PTNI was nightmare distress.

Table 1. Factor Loadings and Item-Total Correlations of PTNI Items

Item	FL	r_t
1. My nightmares are exactly like a stressful event that I experienced.	.79	.54
2. I began having nightmares after I saw or went through a stressful event.	.80	.56
3. Bad things that I have experienced often replay in my nightmares.	.87	.66

Table 2. Pearson Correlations Between Scales

Scale	2	3	4	5	M	SD	α
1.PTNI	.45	.61	.42	.41	5.20	2.65	.76
2. NFQ-M		.42	.30	.28	1.56	2.43	.83
3. NDQ			.43	.29	21.08	8.60	.91
4. SCL10R				.64	9.61	8.80	.90
5. PCL-SF					12.52	5.60	.86

Note: N = 135. All correlations significant at p<.01. PTNI=Posttraumatic Nightmare Index; NFQ-M=Nightmare Frequency Questionnaire, Modified; NDQ=Nightmare Distress Questionnaire; SCL10R=Symptom Checklist-10R; PCL-SF=PTSD Checklist-Civilian-Short Form.

Correlations between the PTNI and other scales were roughly equivalent in strength.

3.4. Incremental Validity

To investigate the ability of the PNTI to predict trauma symptoms above nightmare frequency, a regression was calculated using PCL-SF scores as the criterion. NFQ-M, scores were loaded on Step 1 while PNTI scores were loaded on Step 2. On Step 1 the NFQ-M accounted for a significant 7.7% of the variance in PCL-SF scores, $F(1, 133)=11.09$, $p<.001$. On Step 2 the PTNI added an additional, significant 9.8% of the variance in PCL-SF scores, $F(1, 132)=15.74$, $p<.001$. A second regression was calculated to examine if the PTNI could predict nightmare frequency above trauma symptoms. Again on Step 1 the PCL-SF accounted for a significant 7.7% of the variance in NFQ-M scores, $F(1, 133)=11.09$, $p<.001$. On Step 2 the PTNI accounted for an additional 13.5% of NFQ-M scores, $F(1, 132)=22.55$, $p<.001$.

3.5. Partial Correlations

Using the approach of Davey, Hampton, Farrell, & Davidson (1992), it was assumed that after controlling for PTNM's the unique source of variance remaining in general nightmare frequency could be considered attributable to idiopathic nightmares. Similarly after controlling general nightmare frequency, the variance remaining in the PTNI might be attributed to PTNM's. Therefore, to examine the utility of the PTNI in differentiating idiopathic and PTNM's, partial correlations were calculated to estimate the differential patterns of relationships for idiopathic and PNTM's by examining the unique variance attributed to either the PTNI or NFQ-M after controlling the other.

Table 3. Partial Correlations of Posttraumatic Nightmares and Nightmare Frequency While Holding the Other Constant

Item	Partial r with PTNI Holding NFQ-M Constant	Partial r with NFQ-M Holding PTNI Constant
NDQ	.53**	.20*
SCL10R	.33**	.14
PCL-SF	.33**	.12

Note: *p<.05 p<.01. PTNI=Posttraumatic Nightmare Index; NFQ-M=Nightmare Frequency Questionnaire, Modified; NDQ=Nightmare Distress Questionnaire; SCL10R=Symptom Checklist-10R; PCL-SF=PTSD Checklist-Civilian-Short Form.

As presented in Table 3, after controlling for PTNI scores, NFQ-M scores remained significantly related only to nightmare distress. Correlations for NFQ-M scores after controlling for PTNI scores were about half as strong as uncontrolled correlations reported in Table 2. However, after controlling NFQ-M scores, PTNI scores remained significantly related to nightmare distress, general distress, and trauma symptoms.

4. Discussion

This study reported the development of a brief, internally reliable measure of the general experience of PTNM's which possessed preliminary evidence of convergent and incremental validity. The measure correlated with hypothetically related measures of nightmare frequency, PTSD symptoms, general distress, and nightmare distress, and predicted nightmare frequency and trauma symptoms independently of each other. The separate variances accounted for by the PTNI and NFQ-M scores observed in the partial correlations, support that they tap separate constructs. As such, attempts should be made by researchers to separate PTNM's from general nightmare frequency (Levin & Nielsen, 2007). Also, the regression results suggested that the PTNI was separate from PTSD symptomatology. This was consistent with the idea that nightmares might be symptomatic of difficulties adapting to traumata, but occur separately from PTSD (Germain, 2013).

It is noteworthy that the strongest correlate of the PTNI in the current study was nightmare distress. The PTNI also more strongly predicted nightmare distress compared to nightmare frequency. Moreover, the PTNI accounted for significant unique variance in general distress whereas nightmare frequency did not. These findings are consistent with Levin & Nielsen's (2007) suggestion that PTNM's, relative to idiopathic, are more distressing. This finding also suggests that consistent findings relating general nightmare frequency to general distress (i.e., Schredl, 2003) and to PTSD symptoms (i.e., Krakow et al., 2002) might reflect PTNM's more than idiopathic nightmares. Future research is needed to more systematically examine these possibilities.

The current research and the PTNI have several limitations that should be considered. For instance, though the brevity of the scale allows it to be easily included in longer protocols, it doesn't allow for a thorough examination of PTNM's. For instance, the nature of the scale does not allow estimation of actual frequencies of idiopathic and PTNM's, as does the NITE (Schreuder et al., 1998). Instead, however, by using the PTNI and a measure of general nightmare frequency, patterns of relationships with outcome measures can be compared for PTNM's and idiopathic nightmares.

Another limitation is that the sample in the current study was relatively small and included only university students making generalization to clinical and community samples difficult. For instance, levels of psychopathology and experiences of traumatic events were not assessed. A cursory comparison of average scores reported elsewhere indicated that the current sample's average NFQ-M was much lower than was reported for a traumatized sample (Krakow et al., 2002). Also, the SCL10R score in the current sample was substantially lower than was reported for a sample of military veterans undergoing PTSD treatment (Rosen et al., 2007). PCL-SF scores were similar to a group of military personnel and veterans enrolled in university courses (Bryan, Theriault, & Bryan, 2015), though more than one-third of the current

sample exceeded the cut-score suggestive of PTSD (Lang & Stein, 2005). These findings characterize the current sample as moderately traumatized but not overly distressed. Further research replicating these results with larger, more diverse samples, and including measures of psychopathology is needed.

Also, occurrence of traumatic events was not assessed to examine if PTNI scores were linked to trauma experiences with or without PTSD. This should be examined in future research. An interesting finding, however, is that we were able to assess variance attributed to PTNM's in a nonclinical sample. This could reflect previous findings that a large percent of the general population has experienced traumatic events, even if they do not develop PTSD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

Another limitation of the current study was the reliance on retrospective self-report measures. Future research could compare PTNI scores with prospective measures of nightmares and nightmare distress along with structured clinical interviews to assess for PTSD and PTNM's. Finally, future research could examine the degree to which the PTNI represents Schreuder et al.'s (2001) replicative, symbolic, or mixed PTNM typology. Future research might also examine the properties of the PTNI using clinical samples and among individuals formally diagnosed with PTSD.

The current research demonstrated that the general experience of PTNM's can be quickly assessed using a psychometrically sound scale. Further, it is possible to compare mechanisms that influence idiopathic and PTNM's separately by accounting for their unique sources of variance even among nonclinical samples. Finally, future research should examine if previous findings of general nightmare frequency were the result of PTNM's rather than idiopathic nightmares, as they might have been assumed to have been among nonclinical samples.

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