

ORIGINAL ARTICLE

The Nightmare Proneness Scale: A Proposed Measure for the Tendency to Experience Nightmares

William E. Kelly^{1*}

¹Robert Morris University

ABSTRACT

This article presents three studies aimed at the development and analysis of a proposed measure of nightmare proneness, the tendency to experience nightmares frequently. In Study 1 a sample of 205 university students was utilized to create the Nightmare Proneness Scale (NPS), consisting of personality and symptomatology items that significantly differentiated between individuals reporting frequent nightmares and controls. Study 2 cross-validated the ability of the NPS to discriminate between frequent nightmare reporters and controls among a sample of 275 students. Study 2 also found that the NPS accounted for unique variance in nightmare frequency above other measures of distress. The NPS possessed adequate internal consistency across all studies. Study 3 demonstrated satisfactory test-retest reliability of the NPS. The results and suggestions for future research were discussed.

Keywords: nightmares, dreams, personality, sleep, self-report scales, mental health

INTRODUCTION

Most sleep scientists agree that everyone dreams, though not everyone recalls dreaming (Herlin, Leu-Semenescu, Chaumereuil, & Arnulf, 2015). For most individuals, dreaming is usually a benign, perhaps meaningful activity (Yu, 2013). However, for some individuals dreams become the terrifying experience of nightmares. Nightmares have been defined as realistic story-like dreams which elicit unpleasant emotions such as fear and anxiety; often nightmares involve feelings of imminent threat to safety (American Psychiatric Association, 2013). In one large sample of the general population, 52% of

individuals reported having experienced at least one nightmare as an adult and about 14% report having experienced nightmares at least monthly (Schredl, 2013). Despite the high incidence of nightmares and their apparent effect on daytime mood (Schredl, 2009a), what makes some individuals more at risk of developing nightmares than others is not well understood.

Freud (1900) suggested that nightmares were the result of intense internal conflict and lessened ego strength that are expressed during sleep due to decreased censorship of repressed content. He later added that nightmares might be a repetition of past trauma as an attempt to alleviate strong negative affect (Freud, 1920). More recently, it was proposed that nightmares result from a lack of adequate mental boundaries, essentially the mind's structure does not have the defensive abilities to keep threatening information at bay during sleep, and perhaps not when awake as well (Hartmann, Russ, Van der Kolk, Falke, & Oldfield, 1981). Levin and Nielsen (2007) articulated a model that nightmares are the sleeping

*Correspondence: kellyw@rmu.edu
William Kelly, Department of Social Sciences; Robert Morris University;
6001 University Blvd; Moon Township, PA 15108-1189



brain's attempt to work through and diminish fear-related traumatic memories. These theoretical models generally share the notion that some content has been either pushed from awareness by the waking mind or not adequately dealt with, but then find expression as fear-provoking experiences during sleep.

To some extent these models have been consistent with the continuity hypothesis of dreams: individuals experience dreams that are reflective of their waking states of consciousness (Domhoff, 1996). The continuity hypothesis, in relation to nightmares, has been supported by previous empirical findings that found associations between the experience of nightmares and unpleasant and/or unusual waking experiences such as dissociative tendencies (Cheung, 2012), trauma (Nadorff, Nazem, & Fiske, 2011), schizotypal traits (Watson, 2001), depression and suicidality (Cukrowicz et al., 2006), anxiety (Coolidge, Segal, Coolidge, Spinath, & Gottschling, 2010), and general psychological distress symptoms (Levin & Fireman, 2001). In addition to what might be considered unpleasant psychological *states* noted previously, a consistent finding of previous studies has been that nightmares were related to unpleasant *trait* psychological experiences. For instance, nightmares have been related to the trait personality factor known as neuroticism (Schredl, Landgraf, & Zeiler, 2003). It has also been found that trait dispositions may influence the occurrence of nightmares in individuals experiencing unpleasant psychological states (Blagrove & Fisher, 2009).

Both Berquier and Ashton (1992) and Kelly (2016) found that nightmares were associated with scores on broad-spectrum personality instruments which might reflect personality maladjustment and related psychological symptomology. Recently, Sheaves et al. (2016) produced similar findings and observed that nightmares were related to several markers of mental illness in a college student sample. These previous findings provided support for the notion that psychological maladjustment, states, and traits were predictive of nightmare experiences. However, previous research has tended to examine general symptom and personality factors rather than specific markers within those factors in relation to nightmares. The aim of the

current investigation was to develop an instrument consisting of specific psychological maladjustment markers of the tendency to experience frequent nightmares, or what could be termed nightmare proneness. Examination of specific markers of nightmare proneness could both elucidate specific predictors of nightmares and provide researchers a tool to better understand why some individuals experience nightmares more often than others. Additionally, an instrument consisting of specific markers of nightmare proneness might identify individuals "at risk" for experiencing nightmares so that early interventions can be developed.

STUDY 1: SCALE DEVELOPMENT

The purpose of Study 1 was to identify specific items measuring traits and symptomatology that predicted frequently experienced nightmares, and thus establish a proposed instrument to measure nightmare proneness. To this end, an existing broadband measure encompassing several domains of distress and maladjustment was used as an item pool. The intent was, using a criterion-key approach (i.e., Gregory, 2011), to select specific items for a proposed instrument that significantly discriminated between individuals who reported frequent nightmares and controls.

Method

Participants and Procedures

After obtaining informed consent, 205 university students (147 females, 52 males, 6 did not identify sex) completed the instruments described below. Participants were recruited from various undergraduate and graduate-level psychology courses. The average age of the sample was 22.22 years ($SD = 4.22$).

Instruments

Nightmares. The experience of frequent nightmares was assessed by using the following item: "I have nightmares every few nights." Participants responded "True" or "False." Twenty-nine percent ($n = 60$) of

participants in the current sample responded "True" and were designated as the nightmare group. The remainder of participants ($n = 145$) were designated as the control group.

Nightmare Proneness Item Pool. The 52 items of the Ausburg Multidimensional Personality Instrument (AMPI; Kelly, 2012a, b) were utilized as an item pool for assessing nightmare proneness. The AMPI was chosen because it includes items measuring several domains of personality and symptomatology. The 10 clinical scales and three validity scales of the AMPI were designed to be conceptually similar to those of the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1943), but relatively brief and intended for nonclinical samples (Kelly, 2012a, b). Clinical scales included measures of somatic symptoms (Somatization), depressive symptoms (Dysphoria), hysteria-related items (Hystericality), deviant processes and attitudes (Psychodeviance), cultural interests and sensitivity (Feminine Interests), suspiciousness (Paranoia), anxiety symptoms (Anxiousness), unusual perceptual processes (Schizotypic), high energy (Hypomania), and shyness and social avoidance (Introversion) (Kelly, 2012a). The validity scales assessed social desirability (Virtuousness), possible exaggeration of responses (Unlikeliness), and denial of commonly experienced unpleasant issues (Guardedness) (Kelly, 2012b). Participants responded using a 7-point scale where 1 = "Strongly Disagree" and 7 = "Strongly Agree."

Results and Discussion

To select items that best represented nightmare proneness in the current study, separate t -tests were calculated for each of the 52 AMPI items. A Bonferroni correction indicated that an adjusted significance value of $p < .0001$ would be needed to reduce Type 1 error. This corresponded to a t value of 3.6 or above. Using this criteria, 14 items significantly discriminated (had t values of 3.6 or above) between the nightmare group and controls. These items were termed the Nightmare Proneness Scale (NPS) and retained for further analysis. NPS items, their means, and t -values are presented in Table 1. The coefficient alpha reliability for the 14 items among the full sample was .88. The average summed scale score for the 14 items in the full sample was 40.00 ($SD = 15.85$). Total scores for the nightmare ($M = 52.38$, $SD = 14.90$) and control ($M = 34.88$, $SD = 13.21$) groups were, as would be expected, statistically significantly different, $t(203) = 8.31$, $p < .0001$, providing some preliminary evidence of criterion group validity.

The AMPI items that comprised the NPS were largely drawn from several AMPI factors including Somatization (3 items), Anxiousness (2 items), Dysphoria (2 items), Hystericality (2 items), Paranoia (2 items), Schizotypic (2 items), and Hypomania (1 item). Interestingly, no validity scale items and no items from the Psychodeviance, Feminine Interests, or Introversion scales significantly discriminated nightmare reporters. These findings

Table 1: Nightmare Proneness Scale Items, Means between Groups, and t -Values (Study 1)

| Item | M1 | M2 | t |
|---|------|------|------|
| 1. I often feel a pain in my head. | 2.38 | 3.97 | 5.97 |
| 2. I am disappointed by where I am in life. | 2.02 | 3.03 | 4.28 |
| 3. I am uncertain why I do the things I do. | 2.46 | 3.47 | 3.71 |
| 4. It is usually safer to trust no one. | 3.37 | 4.57 | 4.39 |
| 5. I often have indigestion. | 2.01 | 2.95 | 3.77 |
| 6. The future looks bleak and hopeless to me. | 1.26 | 1.95 | 4.27 |
| 7. I become stressed easily. | 4.01 | 5.22 | 4.29 |
| 8. Sometimes in the dark, I see shapes or forms but nothing is there. | 2.13 | 3.33 | 4.34 |
| 9. My mind has been so full of different ideas I couldn't focus on one thing. | 3.08 | 4.47 | 4.61 |
| 10. I have to constantly be on my guard, even around friends. | 2.77 | 4.10 | 5.00 |
| 11. Many nights I cannot get to sleep because of worry or tension. | 2.94 | 4.75 | 5.93 |
| 12. Sometimes I think I hear someone talking, though no one is there. | 1.41 | 2.35 | 4.62 |
| 13. My stomach is often upset. | 2.41 | 3.88 | 5.63 |
| 14. My moods change suddenly for no apparent reason. | 2.63 | 4.35 | 5.78 |

Note: $N = 205$. M1 = average response for nightmare group. M2 = average response for control group. All t values are statistically significant at the $p < .0001$ level.

provide some insight into the experience of individuals with frequent nightmares, and consistent with previous research, suggested that individuals prone to nightmares have a tendency to also experience particular unpleasant symptomatology including anxiety, unusual perceptual and thinking processes, and mood disturbance (Berquier & Ashton, 1992; Cukrowicz et al., 2006; Kelly, 2016; Levin & Fireman, 2001).

STUDY 2: CROSS VALIDATION

The aim of Study 2 was to cross-validate the proposed instrument developed in Study 1 by examining again its ability to discriminate between individuals experiencing frequent nightmares and controls. Given that the items of the NPS seem to measure neurotic traits and distress symptoms, in order to consider it a measure of nightmare proneness, it seemed necessary to examine if the NPS was able to account for unique variance in nightmares above other forms of distress. As such, three comparison variables were selected – sleep disruption, mood disturbance, and anxiety.

Method

Participants and Procedures

After obtaining informed consent, 275 university students (156 females and 119 males) completed the scales described below. Participants were recruited from introductory psychology courses. The average age of the sample was 18.77 ($SD = 1.29$).

Instruments

Nightmare Proneness Scale (NPS). The NPS included the 14 items selected in Study 1. Participants responded using a 7-point scale where 1 = "Strongly Disagree" and 7 = "Strongly Agree." Responses were summed to produce a total NPS score with higher scores indicating more nightmare proneness.

Nightmare Frequency. To assess nightmare frequency, participants estimated the number of nightmares they experienced. Response options were 0 = never, 1 = less than once a year, 2 = about once a year, 3 = about 2 to 4

times a year, 4 = about once a month, 5 = about 2 to 3 times a month, 6 = about once a week, 7 = several times a week (Schredl, 2003). The test-retest reliability of this single-item scale has been estimated at .75 across four weeks (Stumbrys, Erlacher, & Schredl, 2013). The measure has been correlated with hypothetically related variables providing some evidence of construct validity (i.e., Schredl, 2003).

Sleep Disturbance. A measure of sleep disturbance was obtained using the 8-item insomnia scale of the SLEEP-50 Questionnaire (SLEEP-50 Insomnia; Spoormaker, Verbeek, den Bout, & Klip, 2005). Participants responded using a 4-point scale (1 = "Not at All" to 4 = "Very Much") to the extent to which each item had been applicable to them over the past four weeks. A sample item is "I have difficulty falling asleep." Spoormaker et al. reported adequate validity and reliability ($\alpha = .85$). Responses were summed to produce a total SLEEP-50 Insomnia score with higher scores indicating more insomnia.

Mood Disturbance. The 9-item Mania Scale of the Affective Self Rating Scale (ASRS-M; Adler, Liberg, Andersson, Isacson, & Hetta, 2008) was used as a sample of mood disturbance in the current study. Participants responded using a 5-point scale (0 = "None" to 4 = "Very Severe") about the extent to which they had experienced several manic symptoms over the past week. A sample item was "Overactive... being wound up or overactive." Adler et al. reported some evidence for the validity and reliability ($\alpha = .91$) of the scale. Responses were summed to produce a total ASRS-M score with higher scores indicating more manic symptoms.

Anxiety. A sample of anxiety was obtained using the three-item version of the Mini-Social Phobia Inventory (Mini-SPIN; Conner, Kobak, Churchill, Katzelnick, & Davidson, 2001). Participants responded to items using a 5-point scale (0 = "Not at All" to 4 = "Extremely"). A sample item is "I avoid activities in which I am the center of attention." Evidence of reliability ($\alpha = .91$) and validity have been reported (Seeley-Wait, Abbott, & Rapee, 2009). Responses were summed to produce a total Mini-SPIN score with higher scores indicating more social anxiety.

Table 2: Reliabilities, Means, Standard Deviations, and Correlations Between Scales (Study 2)

| | 2 | 3 | 4 | 5 | α | M | SD |
|----------------------|------|------|------|------|----------|-------|-------|
| 1. NF | .38* | .24* | .34* | .18* | | 3.01 | 1.77 |
| 2. NPS | | .38* | .56* | .44* | .85 | 40.03 | 14.02 |
| 3. ASRS-M | | | .40* | .11 | .80 | 11.46 | 6.63 |
| 4. SLEEP-50 Insomnia | | | | .26* | .83 | 16.68 | 5.50 |
| 5. Mini-SPIN | | | | | .82 | 5.43 | 3.46 |

Note: $N = 275$. * $p < .01$. NF = Nightmare Frequency; NPS = Nightmare Proneness Scale; ASRS-M = Affective Self Rating Scale – Mania; Mini-SPIN = Mini Social Phobia Inventory.

Results and Discussion

To test the discriminative power of the NPS for frequent nightmares, a more rigorously defined nightmare group than used in Study 1 was created by selecting participants who reported nightmares at least once a week (option 6 & 7). Using this approach, nine percent of the sample ($n = 25$) were designated the nightmare group. The remaining 250 participants were considered the control group. The nightmare group ($M = 52.36$, $SD = 12.50$) scored significantly higher than the control group ($M = 38.80$, $SD = 13.58$), $t(273) = 4.80$, $p < .0001$, on the NPS. These results cross-validated the results of Study 1 and provided additional evidence of the criterion group validity of the NPS.

The coefficient alphas, means, standard deviations, and correlations between scales in the current study are presented in Table 2. As seen in the table, The NPS and nightmare frequency (as a continuous measure) were significantly correlated. However, the NPS was also correlated at least as highly with the three comparison variables in the study, the ASRS-M, SLEEP-50 Insomnia, and the Mini-SPIN.

To determine if the NPS was able to account for variance in nightmares above the comparison variables, a multiple regression was calculated using nightmare frequency (continuous variable) as the criterion variable. On Step 1 the comparison variables, the ASRS-M, SLEEP-50 Insomnia, and the Mini-SPIN scores, were entered as predictors. The on Step 2, NPS scores were entered as an additional predictor. Together on Step 1, the three comparison variables combined to account for 13% (adj. R^2) of the variance in nightmare frequency, which was significant, $F(3, 269) = 14.37$, $p < .001$. On Step

2, the NPS accounted for an additional 16% (adj. R^2) of the variance in nightmare frequency ($\beta = .24$) above the comparison variables, which was also significant, $F(1, 268) = 10.24$, $p < .01$.

The findings of Study 2 indicate that the NPS again had good internal consistency (.85), was able to discriminate between individuals who reported frequent nightmares and controls, and was able to predict nightmares above other forms of distress (discriminative validity). As an additional indicator of validity, the NPS was significantly correlated with variables that are consistent with the experience of nightmares. Given the correlations between the NPS and comparison variables used in the current study, this latter finding was particularly important in considering the NPS as a measure with some specificity of nightmares proneness relative to measuring maladjustment and psychological distress symptoms.

STUDY 3: TEST-RETEST RELIABILITY

The previous two studies provided preliminary evidence that the NPS had adequate internal consistency and validity. The purpose of Study 3 was to estimate the stability of NPS scores across time in the form of test-retest reliability. After obtaining informed consent, 59 students (35 females, 24 males) enrolled in upper level undergraduate psychology courses completed the NPS and then completed the NPS again one week later. The average age of the sample was 20.05 years ($SD = 1.77$). On both occasions, the NPS was administered as described in Study 2. The internal consistency in the first and second administration of the NPS was .82 and .84, respectively. The test-retest correlation was .72, indicating satisfactory test-retest reliability of the NPS.

General Discussion

The NPS was developed as an attempt to assess the proneness to experience frequent nightmares. Previous research had determined that nightmares were correlated with a tendency to experience general factors of neurotic traits (Schredl, 2003) and psychological distress symptoms (Levin & Fireman, 2002). However, previous studies did not specify which items of these traits were most predictive of nightmares. The current study, thus, extends previous findings and provides a tentative instrument that can be used for researchers to assess a general tendency to experience nightmares. Currently, most research seems to measure the experience of nightmares using a single item (i.e., Nielsen, 2010; Schredl, 2003). Although this appears to tap the construct adequately, a single item has less statistical variance, and is thus likely less sensitive in attempts to understand the experience of nightmare proneness. The NPS is a starting point for using multi-item measures of nightmare proneness that allow both an understanding of the more nuanced experience of nightmare proneness through its specific items and a summative general tendency toward nightmare proneness.

Given that the items of the NPS seem to reflect some general vulnerability (i.e., "I become stressed easily"), difficulties with mood regulation (i.e., "My moods change suddenly for no apparent reason"), and issues with reality testing (i.e., "Sometimes I think I hear someone talking, though no one is there"), the experience of nightmares appears to reflect some difficulties with ego functioning. This is consistent with previous findings that nightmares were related to ego strength (Levin, 1989).

The broad spectrum of NPS items provides some understanding of the experience of nightmare reporters as consisting of mood and anxiety symptoms, and the experience of schizotypic experiences. Additionally, an interesting finding in the selection of NPS items was that the largest number of items from any AMPI factor that differentiated between nightmare reporters and controls involved somatic complaints. The finding that somatic complaints are strong correlates of nightmares was perhaps not intuitively obvious, but nevertheless has

been observed previously (Grandi, Fabbri, Panattoni, Gonnella, & Marks, 2006; Levin & Fireman, 2002).

From the current investigations, the NPS appears to possess satisfactory reliability (both internal consistency and test-retest). Further, findings of criterion group validity and correlations with variables previously shown to be related to nightmares – insomnia, manic symptoms, and anxiety (c.f., Kelly, 2016; Nadorff et al., 2011; Schredl, 2009b) was encouraging. Moreover, the finding that the NPS accounted for variance in nightmares in addition to that of other measures of distress was also encouraging. Additional research on the scale's properties and correlates in diverse samples is still needed. It would be useful to test NPS correlations with additional variables that previously have been related to, and theorized to correlate with, nightmares. For instance, previous research has found nightmares were related to thin psychological boundaries (Schredl, Kleinfurher, & Gell, 1996). Hence, the NPS should also correlate with psychological boundaries. Further, it would be useful to examine if the NPS can account for additional variance in nightmares above a measure of distress such as the Symptom Checklist (Derogatis, 1994). A factor analysis of the NPS might also be revealing to better understand the internal workings of nightmare proneness as measured by the NPS. This might provide researchers with a better understanding of the inner experience of nightmare reporters. As another indicator of construct validity, additional work might examine the relationship between the NPS and nightmare distress in addition to nightmare frequency (cf., Schredl et al., 2003). As can be gleaned, the findings on the NPS thus far should be considered preliminary.

Though the results of the current study on the qualities of the NPS are encouraging, there are limitations that should be considered. For instance, the scale was developed and examined solely using college student samples. Additional research using diverse general population samples is suggested. Also, the scale is relatively brief and items were drawn from another relatively brief instrument. It might be useful to attempt to develop other nightmare proneness scales either using items developed specifically to assess nightmare

proneness or from other, more lengthy instruments that more thoroughly sample their domains of interest. Finally, the evidence that the NPS measures nightmare proneness outside of general maladjustment or symptomatology shows promise, but is not extensive. Additional evidence of this is needed to demonstrate the discriminative validity of the instrument.

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Conflicts of Interest

The author does not declare any conflict of interest.

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