

# Nightmare Prevalence, Nightmare Distress, and Self-Reported Psychological Disturbance

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**Study Objectives:** The relationship between nightmare prevalence, nightmare distress, and self-reported psychological disturbance was assessed prospectively.

**Design:** Differences in self-reported psychological disturbance as a function of nightmare prevalence was investigated by MANCOVA's with non-nightmare dreams as the covariate as well as Pearson correlations. The relative contribution of nightmare prevalence and distress to the prediction of psychological disturbance was investigated through multiple regression analyses.

**Setting:** N/A.

**Participants:** 116 participants (mean age = 20 years) completed self-report indices of depression, anxiety, dissociation, psychosis-proneness, and a psychiatric symptom checklist and kept a nightmare log for 21 consecutive nights.

**Interventions:** N/A.

**Measurements and Results:** Frequent nightmares were associated with higher levels of psychological disturbance. Individuals who reported 3 or

more nightmares across the 3 weeks reported more dissociation, psychosis-proneness and psychiatric symptoms than participants reporting 2 nightmares or less. However, nightmare prevalence and distress were not significantly correlated and differentially predicted to different types of waking psychological disturbance. Multiple regressions further indicated that nightmare distress accounted for much of the unique explanatory variance in predicting clinical states associated with high negative affect (anxiety and depression). Last, there was no evidence for a specific relationship between nightmares and psychosis-proneness.

**Conclusions:** The findings suggest that it is not the incidence of nightmares which is associated with poorer waking psychological functioning, especially anxiety and depression states, but the reported distress associated with the nightmare experience which is the critical variable in predicting higher psychological disturbance.

**Key words:** Nightmares; nightmare distress; parasomnias; psychopathology; psychosis-proneness

## INTRODUCTION

IDIOPATHIC NIGHTMARES, OPERATIONALLY DEFINED BY BOTH THE DSM-IV<sup>1</sup> AND THE ICSD-R<sup>2</sup> CRITERIA AS VIVID DREAMS MARKED BY INTENSIFIED feelings of dread or terror that awaken the individual, are the most common form of the parasomnias.<sup>1,3</sup> Unlike the repetitive re-enactment nightmares which usually follow exposure to trauma, idiopathic nightmares are often of long standing duration and begin in the absence of an identifiable exogenous trigger.<sup>4,5</sup> However, little is known about their etiology, pathophysiology, and connection with waking psychological functioning. Understanding how nightmare behavior relates to well-being could help the sleep medicine practitioner as well as the general healthcare practitioner recognize when nightmares are particularly problematic for waking functioning.

Occasional nightmares are quite common with about 85% of respondents reporting at least one attack within the past year.<sup>6-8</sup> However, between 2% and 6% of these participants report week-

ly nightmare attacks.<sup>9-11</sup> Importantly, recent work<sup>12-13</sup> indicates that retrospective measures significantly underestimate actual nightmare occurrence as monitored by prospective nightly dream logs, suggesting that nightmares are more common than usually thought.

Given the highly negative-arousing quality of these dreams, much of the recent experimental research has investigated whether frequent nightmares are associated with poorer waking psychological functioning. With a few exceptions<sup>12,14</sup> most studies have found that individuals who report frequent nightmares score higher than controls on a range of measures indicating greater psychological disturbance,<sup>4,7,13,15-24</sup> Nightmare prevalence also predicted psychiatric disorders in children and adults in two recent community-based epidemiological studies.<sup>18,25</sup> Furthermore, there is evidence that frequent nightmares may have a specific association with schizophrenia-spectrum pathology, particularly schizotypy.<sup>4,21-23,26-35</sup>

However, a number of important questions remain unanswered. First, it is unclear to what extent frequent nightmares are specifically associated with schizophrenia-spectrum disorders rather than higher overall psychological disturbance. Second, it is not known to what degree these associations are due to increased nightmare prevalence or to the emotional distress engendered by the nightmares. Third, to our knowledge, no study has looked prospectively at the relationship between nightmare prevalence, nightmare distress, and psychopathology. This is important as respondents' retrospective reporting of both nightmare incidence and distress may be contaminated by response set biases which could significantly impact on the observed relationships between these variables.

The distinction between nightmare prevalence and distress has

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Nothing to Disclose.

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recently received considerable attention.<sup>36-38</sup> Belicki<sup>14</sup> found that nightmare prevalence and nightmare distress were moderately correlated ( $r=.26$ ) with only the distress dimension being associated with heightened psychopathology. However, Belicki did not include measures of schizotypy and relied on a retrospective nightmare frequency report instead of prospective dream logs to assess nightmare incidence and distress. Wood and Bootzin<sup>12</sup> reported a similar magnitude of association between frequency and distress by using dream logs but their study only assessed manifest anxiety. Zadra and Donderi,<sup>13</sup> also using dream logs, found nightmares to be significantly associated with lower well-being but also did not include measures of schizotypy and did not investigate nightmare distress as a possible mediator between prevalence and psychological disturbance.

The purpose of the present study was to address these limitations by investigating the relationship between both nightmare prevalence and nightmare distress as measured by prospective dream logs, and a broad range of self-report measures of psychopathology which have been previously demonstrated to be associated with nightmare production.<sup>12-14</sup> Towards this end, we administered measures of anxiety, depression, dissociation, psychosis-proneness, and the SCL-90-R, a frequently used psychiatric symptom checklist.

We predict that: 1) nightmare prevalence will be associated with increased scores on all clinical measures (indicating lower well-being), and; 2) these effects will not be due to higher levels of overall non-nightmare dream recall. Additionally, we predict that: 3) the observed relationships between nightmare prevalence and psychological disturbance will be largely attributable to level of nightmare distress with one exception: schizotypy. We suggest that for individuals scoring high on this measure, nightmares may occur with greater regularity and be experienced as more ego-syntonic than when nightmares are associated with other clinical disorders and thus, be experienced with less distress. This is because of the long-standing development of schizotypy as well as the increased congruence between bizarre nocturnal imagery and the loosening of thought processes typical of waking schizotypal functioning. Thus, for the schizotypy measures, we predict that: 4) nightmare prevalence will contribute unique predictive variance, irrespective of level of subjective distress.

## METHOD

### Participants

One hundred sixteen undergraduates (31 men, 85 women, mean age = 19.8,  $SD = 2.3$ ) at a large state university voluntarily participated in the study for course credit over a period of three academic semesters. Given the low base rate of frequent nightmares in the general population, participants were initially screened for subsequent selection from a brief in-class dream and nightmare questionnaire which was embedded in a larger packet of screening measures to ensure that there would be enough data to utilize in the subsequent investigation. Participants were given a concise description of nightmares and how these differ from related dream disturbances (night terrors, repetitive traumatic dreams). A nightmare was defined as "a scary dream that awakens the dreamer from sleep." Participants were asked to indicate how often they had had a nightmare within the past year by checking one of six broadly defined categories ("not at all," "once

or twice a year," "3—10 a year," "once a month," "once a week," and "more than once a week"). Individuals who indicated having at least "3—10 a year" were chosen for inclusion. The overrepresentation of women to men in the final sample reflected the demographic makeup of the introductory psychology class and is consistent with previous research indicating higher nightmare reporting rates in women.<sup>8,11-12,16</sup>

### Procedure and Measures

Upon completion of the mass testing survey, prospective participants were contacted by a research assistant and offered an opportunity to participate for class credit and a \$10 payment. About half of the individuals contacted agreed to participate. Participants were not informed as to why they were selected to avoid establishing a response set regarding nightmare experience. Rather, they were told that the study was investigating the connection between dreaming and personality. All participants were assured of full confidentiality.

Upon giving phone consent, participants were given an appointment and completed the research protocol in two phases. In the first meeting, students completed the packet of self-report psychopathology measures which included indices of depression, state and trait anxiety, dissociation, schizotypy, and general psychopathology symptomatology. These variables were measured by the Beck Depression Inventory (BDI),<sup>39-40</sup> the State-Trait Anxiety Inventory (STAI),<sup>41</sup> the Dissociative Experiences Survey (DES),<sup>42-44</sup> the Perceptual Aberration-Magical Ideation scale (PerMag),<sup>45-46</sup> and the Symptom Checklist-90-Revised (SCL-90R).<sup>47</sup> Students were then given a 21-day supply of dream logs and were asked to complete each one as soon as possible upon awakening, indicating with a check mark whether they remembered any dreams and nightmares and if so, to indicate how many. In the case of a positive nightmare response, participants were asked to rate the intensity, vividness, and distress engendered by each nightmare on three seven-point Likert-rating scales. However, participants were not required to provide a written transcription of the nightmare. Reminder calls were made each week by a research assistant to facilitate compliance with the experimental protocol and students were instructed to submit their completed logs on a weekly basis.

## RESULTS

### Prevalence of Nightmares and Their Relation to the Self-Report Psychopathology Measures

Based on the prospective logs, participants reported a mean of three nightmares ( $SD=3.66$ ) across the 21 nights with 80% of individuals reporting at least one nightmare. One participant was dropped from the study for failure to complete the dream logs. The sample distribution is presented in Table 1. There was considerable variability with almost half of the participants reporting 0 or 1 nightmares and 9 subjects reporting 10 or more nightmares during the reporting period.

To determine whether nightmare prevalence was associated with higher psychological disturbance, the sample was divided into three groups based on the log data: low nightmare prevalence (0 reported nightmares;  $N=33$ ); medium nightmare prevalence (1—2 nightmares;  $N=36$ ); and high nightmare prevalence

**Table 1**—Number of nightmares reported across 21 nights (N=115)

| Nightmare Total | Frequency | Percent | Cumulative Percent |
|-----------------|-----------|---------|--------------------|
| 0               | 33        | 28.7    | 28.7               |
| 1               | 22        | 19.1    | 47.8               |
| 2               | 14        | 12.2    | 60.0               |
| 3               | 8         | 7.0     | 67.0               |
| 4               | 10        | 8.7     | 75.7               |
| 5               | 7         | 6.0     | 81.7               |
| 6               | 8         | 7.0     | 88.7               |
| 8               | 2         | 1.7     | 90.4               |
| 9               | 2         | 1.7     | 92.2               |
| 10              | 2         | 1.7     | 93.9               |
| 11              | 2         | 1.7     | 95.7               |
| 12              | 1         | .9      | 96.6               |
| 13              | 1         | .9      | 97.5               |
| 14              | 1         | .9      | 98.4               |
| 15              | 1         | .9      | 99.3               |
| 18              | 1         | .9      | 100.0              |

(3 nightmares or greater; N=46, mean number of nightmares = 7.02, SD =3.6). Three nightmares were chosen as the cutoff for the high prevalence group as this figure corresponds to the one nightmare per week criterion often used to identify nightmare disorder patients.<sup>3,16</sup>

A three-way MANCOVA with nightmare condition as the independent variable and non-nightmare dream recall frequency over the 21 nights as the covariate was conducted for the SCL-90-R scales and all other psychopathology measures. Consistent with our first two hypotheses, the high nightmare group reported significantly higher levels of psychological disturbance than the medium and low nightmare groups ( $F(12,97)=1.83, p<.05$  for the SCL-90-R, and  $F(9,99)=2.34, p<.02$ , for all other measures). Further, these results were not attributable to greater overall dream production. The means and standard deviations as well as the results of the univariate analyses and pairwise posthoc comparisons are presented in Table 2. All comparisons were significant except for STAI-State and Trait anxiety, the BDI and the SCL-90-R phobia and paranoia scales, with mean scores of the high nightmare group between a half to one standard deviation higher than the low nightmare group, indicating a medium to large effect size. As can be seen from the table, pairwise post-hoc comparisons revealed a consistent pattern with the high prevalence group scoring significantly higher than either the low or medium prevalence groups who scored comparably. Significantly, nightmare subjects consistently scored more than one standard deviation above the normative mean on the SCL-90-R, a figure generally considered to be clinically interpretable.<sup>47</sup> These differences are perhaps best captured by the Positive Symptom Distress Index, a measure of symptom intensity, where the high nightmare group averaged at the 86th percentile as compared to the 52nd percentile for the medium and low nightmare groups. Thus, having nightmares on a weekly basis or more was associated with increased reporting of psychiatric symptoms as well as heightened distress about these behaviors when they occur.

Another way to look at the SCL-90-R data was to use Derogatis<sup>47</sup> guidelines for identifying clinical cases, operationally defined by a t-score on the General Symptom Index >63 or the presence of any two elevated clinical scales >63. This measure has demonstrated good predictive value with adequate sensitivity and specificity.<sup>47</sup> Using this formula, 64 of the 115 participants met the criteria for "caseness." High nightmare individuals were significantly more likely to be identified as a case (76%) than the combined group of medium and low-nightmare subjects (28%),  $\chi^2(1)=23.76, p<.000$ .

### Nightmare Prevalence vs. Nightmare Distress

Surprisingly, prospective ratings of prevalence and distress were not significantly associated,  $r(79)=-.21, ns$ . Table 3 presents the bivariate correlations between the self-report psychopathology measures and two indices of nightmare experience: nightmare prevalence and nightmare distress as measured by subjects' log ratings. A Bonferroni corrected alpha of .001 (.05/40 comparisons) was set to account for error inflation. Although both nightmare variables were significantly related to most measures of psychological disturbance, these relationships were often stronger for the distress dimension. In fact, nightmare distress was significantly associated with all measures of psychological disturbance save the SCL-90-R phobia subscale while nightmare prevalence was not significantly related to either measure of depression (SCL-90 and BDI), state, or trait anxiety or pathological dissociation.

In order to determine the relative contribution of these variables to the psychopathology measures, separate standard multiple regressions were conducted for each dependent measure with nightmare prevalence and distress entered as the predictor variables. Multiple R's, R squares, and semipartial correlations controlling for shared variance are presented in Table 4.

Two primary patterns emerged from these analyses. First, nightmare prevalence and nightmare distress together accounted for a significant degree of explanatory variance (R<sup>2</sup>'s range from .11 to .36) on all measures. Second, when shared variance was removed, nightmare distress consistently accounted for more unique variance to the prediction of higher psychological disturbance than nightmare prevalence, supporting our third experimental hypothesis. This pattern was most pronounced for measures tapping anxiety and depression. Thus, almost all of the predictive power for the BDI, STAI-State and Trait as well as the SCL-90-R Anxiety and Depression scales was attributable to unique variance contributed by the nightmare distress measure. Significantly, nightmare prevalence was not uniquely predictive of schizotypy and in fact, failed to contribute any significant variance to the Psychoticism scale of the SCL-90-R. Thus, our data failed to support our fourth experimental hypothesis.

Relatedly, when participants were reclassified based on a median split of the two nightmare variables, individuals who had frequent but nondistressing nightmares reported lower levels of psychological disturbance than participants who reported infrequent, highly distressing nightmares. Thus, on the SCL-90-R General Symptom Index, high frequency, low distress participants scored lower ( $M=55.08, SD=7.14$ ) than low frequency, high distress individuals ( $M=64.02, SD=2.0$ ),  $t(16)=2.86, p<.02$ . Similarly, on the Positive Symptom Distress Index, high frequency, low distress subjects scored lower ( $M=52.42, SD=5.48$ )

**Table 2**—Means and standard deviations of SCL-90-R scores (t-scores) and other psychopathology measures by nightmare group

|                                       | Low<br>Nightmare<br>(N=33)    | Medium<br>Nightmare<br>(N=38) | High<br>Nightmare<br>(N=44)   | F    | p    |
|---------------------------------------|-------------------------------|-------------------------------|-------------------------------|------|------|
| <b>SCL- 90 Scale</b>                  |                               |                               |                               |      |      |
| Somatization                          | 51.68 <sup>a</sup><br>(10.20) | 53.54 <sup>a</sup><br>(9.77)  | 61.59 <sup>b</sup><br>(11.48) | 7.46 | .001 |
| Obsessive-<br>Compulsive              | 56.13 <sup>a</sup><br>(9.92)  | 57.14 <sup>a</sup><br>(7.87)  | 63.64 <sup>b</sup><br>(9.70)  | 6.78 | .002 |
| Interpersonal<br>Sensitivity          | 57.13 <sup>a</sup><br>(9.54)  | 57.34 <sup>a</sup><br>(10.05) | 63.69 <sup>b</sup><br>(11.53) | 4.71 | .01  |
| Depression                            | 55.45 <sup>a</sup><br>(8.85)  | 57.17 <sup>a</sup><br>(10.38) | 61.18 <sup>b</sup><br>(10.45) | 3.35 | .04  |
| Anxiety                               | 52.87 <sup>a</sup><br>(9.16)  | 54.23 <sup>a</sup><br>(10.92) | 61.00 <sup>b</sup><br>(12.47) | 5.55 | .005 |
| Hostility                             | 52.32 <sup>a</sup><br>(11.10) | 54.05 <sup>a</sup><br>(8.61)  | 60.09 <sup>b</sup><br>(12.62) | 4.54 | .01  |
| Phobia                                | 52.58 <sup>a</sup><br>(8.45)  | 51.85 <sup>a</sup><br>(8.04)  | 55.24 <sup>a</sup><br>(11.07) | 1.43 | ns   |
| Paranoia                              | 54.35 <sup>a</sup><br>(10.27) | 56.57 <sup>a</sup><br>(10.94) | 60.87 <sup>b</sup><br>(12.71) | 2.70 | .06  |
| Psychoticism                          | 55.45 <sup>a</sup><br>(9.62)  | 58.71 <sup>a</sup><br>(9.73)  | 60.87 <sup>b</sup><br>(12.71) | 3.50 | .03  |
| General Symptom<br>Index              | 54.90 <sup>a</sup><br>(10.71) | 57.89 <sup>a</sup><br>(9.72)  | 63.67 <sup>b</sup><br>(10.57) | 6.14 | .003 |
| Positive Symptom<br>Distress Index    | 54.97 <sup>a</sup><br>(10.46) | 57.43 <sup>a</sup><br>(8.30)  | 62.04 <sup>b</sup><br>(9.32)  | 5.39 | .006 |
| Positive Symptom<br>Total             | 51.42 <sup>a</sup><br>(8.46)  | 53.00 <sup>a</sup><br>(9.48)  | 60.22 <sup>b</sup><br>(10.50) | 7.34 | .000 |
| <b>Other Psychopathology Measures</b> |                               |                               |                               |      |      |
| BDI                                   | 7.35 <sup>a</sup><br>(6.18)   | 7.18 <sup>a</sup><br>(6.76)   | 10.02 <sup>a</sup><br>(7.32)  | 1.72 | ns   |
| STAI-State                            | 36.00 <sup>a</sup><br>(11.92) | 37.23 <sup>a</sup><br>(14.61) | 38.87 <sup>a</sup><br>(13.67) | .32  | ns   |
| STAI-Trait                            | 36.16 <sup>a</sup><br>(11.99) | 40.53 <sup>a</sup><br>(13.39) | 41.48 <sup>a</sup><br>(13.81) | 1.49 | ns   |
| DES                                   | 18.62 <sup>a</sup><br>(14.07) | 20.08 <sup>a</sup><br>(14.48) | 31.16 <sup>b</sup><br>(17.91) | 5.89 | .004 |
| DES-Taxon                             | 8.90 <sup>a</sup><br>(13.61)  | 9.74 <sup>a</sup><br>(13.35)  | 18.70 <sup>b</sup><br>(16.89) | 4.35 | .02  |
| PER-MAG                               | 9.45 <sup>a</sup><br>(6.67)   | 12.13 <sup>a</sup><br>(12.60) | 17.61 <sup>b</sup><br>(12.71) | 4.88 | .009 |

Note: Subscripts with different letters are significantly different ( $p < .05$ ).

than low frequency, high distress subjects ( $M=61.0$ ,  $SD=4.36$ ),  $t(16)=3.13$ ,  $p < .01$ .

## DISCUSSION

The experience of frequent idiopathic nightmares was associated with significantly higher scores on almost all measures of psychological disturbance. Individuals who reported three or more nightmares reported more psychiatric disturbances on most scales of the SCL-90-R as well as greater levels of dissociation and schizotypy than individuals who reported two nightmares or less. Nightmare participants were also more likely to meet the operational criteria of a clinical case on the SCL-90-R than low-nightmare controls. These results are consistent with previous

research<sup>13,19,20-30</sup> and provide further evidence for continuity between waking psychological dysfunction and dream disturbance. These data also provide confirmation for the validity of a once per week diagnostic criterion rather than once a month as a more meaningful demarcator of dysfunctional nightmare behavior.

However, our data also underscore the importance of assessing distress in addition to frequency when investigating the relationship of nightmare behavior to waking functioning. Contrary to previous research,<sup>12,14</sup> which utilized a global measure of nightmare distress, nightmare prevalence and distress were not significantly correlated and differentially predicted to distinct types of self-reported psychopathology. Nightmare distress was associated with higher scores on all measures of psychological

**Table 3**—Bivariate correlations of psychopathology measures with log based nightmare prevalence and nightmare distress

| Psychopathology Measure               | Nightmare Frequency (N=115) | Nightmare Distress (N=77) |
|---------------------------------------|-----------------------------|---------------------------|
| <b>SCL-90-R (T-scores)</b>            |                             |                           |
| Somatization                          | .42 ***                     | .31                       |
| Obsessive-Compulsive                  | .34 ***                     | .54 ***                   |
| Interpersonal Sensitivity             | .36 ***                     | .48 ***                   |
| Depression                            | .27                         | .49 ***                   |
| Anxiety                               | .34 ***                     | .45 ***                   |
| Hostility                             | .39 ***                     | .46 ***                   |
| Phobia                                | .28                         | .18                       |
| Paranoia                              | .34 ***                     | .50 ***                   |
| Psychoticism                          | .28                         | .47 ***                   |
| Global Severity Index                 | .39 ***                     | .55 ***                   |
| Positive Symptom Total                | .36 ***                     | .54 ***                   |
| Positive Symptom Distress Index       | .43 ***                     | .43 ***                   |
| <b>Other Psychopathology Measures</b> |                             |                           |
| BDI                                   | .24                         | .39 ***                   |
| STAI-State                            | .20                         | .49 ***                   |
| STAI-Trait                            | .23                         | .44 ***                   |
| DES                                   | .32 ***                     | .37                       |
| DES-Taxon                             | .21                         | .36 ***                   |
| Perceptual Aberration                 | .39 ***                     | .44 ***                   |
| Magical Ideation                      | .37 ***                     | .39 ***                   |
| PER-MAG                               | .40 ***                     | .42 ***                   |

\*\*  $p < .01$ , \*\*\*  $p < .001$

disturbance save one ( $r$ 's range from .31-.55) while nightmare prevalence was not related to depression (as measured by both the BDI or the SCL-90-R), anxiety (state and trait and the SCL-90-R phobia scale), or pathological dissociation.

This pattern becomes clearer when looking at the regression analyses. Here, ratings of nightmare distress accounted for most of the unique variance in relation to the self-report psychopathology measures characterized by negative affectivity. These results support our first three hypotheses and suggest that it is not the incidence of nightmares which is the critical variable in predicting greater psychological disturbance but the reported distress associated with the nightmare experience which is of paramount importance, particularly for anxiety and depression.

One possible explanation for these findings is that greater nightmare distress is associated with more horrific nightmare content. However, Levin & Fireman<sup>48</sup> found no significant association between three rating dimensions of nightmare saliency and overall prevalence rates. Nonetheless, nightmare prevalence was significantly associated ( $r = .47$ ,  $p < .000$ ) with Belicki's<sup>14</sup> Nightmare Distress Scale, a global retrospective measure. Similarly, global ratings of dreaming and nightmare saliency (imagery vividness, intensity, personal meaningfulness of dreams) were more predictive of nightmare prevalence as measured by nightly logs than concurrent ratings of these same dimensions. Taken together, these data suggest that whether a person reports having a nightmare on any given night is more determined by how they view their global dream processes in

general than with the phenomenal qualities of the actual dream as it is experienced. In this way, nightmare complaints may be similar to subjective complaints of excessive fatigue and associated depression often seen in insomniac patients in the absence of corroborating objective measures of poor sleep.<sup>49</sup>

We believe that whether individuals report greater global nightmare prevalence and distress may be affected by a confluence of conditioned expectancies and predisposing personality variables. For example, such individuals may have lower thresholds for negatively arousing events than those who do not report higher levels of distress. These differences could in turn be predicated on stable intra-individual variations in waking coping abilities, emotional regulation strategies, and degree of sensitivity to threats in the environment. Thus, high global distress individuals may demonstrate hypervigilant perceptual threat schemas which result in the selective processing of negatively arousing emotional stimuli and subsequent enhanced memory for threat-related material, much as chronic PTSD victims do, but without an identifiable discrete trigger event.<sup>50-51</sup> Indeed, recent evidence demonstrating that imagery-rehearsal techniques which target chronic repetitive post-trauma nightmares in crime assault victims result in significant reductions of nightmares as well as non-nightmare PTSD symptomatology is consistent with this formulation.<sup>52</sup>

Our results also help to reconcile earlier disparate findings. Prior studies, which found no relationship between nightmare prevalence and psychological disturbance<sup>12,14</sup> relied extensively

**Table 4**—Standard multiple regressions and semipartial correlations of nightmare frequency and nightmare distress to psychopathology measures controlling for shared variance

| SCL-90-R Scale                  | R          | R <sup>2</sup> | Nightmare Frequency | Nightmare Distress |
|---------------------------------|------------|----------------|---------------------|--------------------|
|                                 | ***        |                | ***                 | **                 |
| Somatization                    | .46<br>*** | .21            | .34<br>*            | .23<br>***         |
| O-C                             | .58<br>*** | .34            | .21<br>**           | .49<br>***         |
| Interpersonal Sensitivity       | .55<br>*** | .30            | .27<br>*            | .41<br>**          |
| Depression                      | .53<br>*** | .28            | .21<br>*            | .44<br>***         |
| Anxiety                         | .50<br>*** | .25            | .21<br>***          | .40<br>***         |
| Hostility                       | .57<br>*   | .32            | .33<br>*            | .38<br>*           |
| Phobia                          | .33<br>*** | .11            | .27<br>*            | .12<br>***         |
| Paranoia                        | .54<br>*** | .29            | .21                 | .44<br>***         |
| Psychoticism                    | .49<br>*** | .24            | .15<br>**           | .43<br>***         |
| General Symptom Index           | .60<br>*** | .36            | .25<br>**           | .48<br>***         |
| Positive Symptom Distress Index | .52<br>*** | .27            | .30<br>*            | .35<br>***         |
| Positive Symptom Total          | .60<br>*** | .36            | .26<br>*            | .47<br>***         |
| Other Psychopathology Measures  |            |                |                     |                    |
| PER-MAG                         | .49<br>*** | .24            | .25<br>*            | .36<br>**          |
| DES                             | .44<br>**  | .20            | .24                 | .31<br>**          |
| DES-Taxon                       | .39<br>*** | .15            | .15                 | .31<br>**          |
| BDI                             | .42<br>*** | .18            | .16                 | .34<br>***         |
| STAI-State                      | .50<br>*** | .25            | .10                 | .46<br>***         |
| STAI-Trait                      | .46        | .21            | .09                 | .42                |

\* p<.05, \*\* p<.01, \*\*\* p<.001

on measures of anxiety and depression. Our data confirms these earlier reports and suggests that while prevalence is minimally related to expressions of waking psychological disturbance characterized by negative affectivity (depression and anxiety), it does predict poorer global well-being. In this sense, our findings regarding the lack of specificity of nightmare prevalence in the prediction of schizotypy suggests that much of the previous work demonstrating such a relationship may have conflated distress with prevalence.

Given that dreaming is characterized by extensive limbic system activation<sup>53</sup> and that idiopathic nightmares represent an intensification of the normative dreaming process,<sup>3</sup> we suggest that individuals who experience continual high levels of reactive

distress to their dreams may evidence signs of faulty emotional processing which could have deleterious effects in waking functioning. As the association found in this study and most others between nightmare behavior and waking psychological distress is correlational, it is difficult to ascribe causal mechanisms based on the present data and longitudinal studies of individuals with both frequent nightmares and heightened distress would be invaluable in understanding the pathogenesis of these phenomena.

Our data should be viewed with some caution as some of the nightmares in the present study may be a long-term sequela of childhood trauma/abuse. Although we attempted to control for this by providing information on the type of nightmares being investigated, future research should investigate this question

more systematically through the use of structured clinical interviews. Nevertheless, these data have significant clinical implications. Frequent nightmares are associated with poorer waking psychological functioning as well as other sleep-related disorders.<sup>54-55</sup> Given this, we suggest that inquiring about nightmare behavior in routine clinical assessments is likely to enhance the sleep medicine practitioner's understanding of their patients' response to disruptions in emotional processing and thus, better inform future treatment decisions.

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