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Nightmare frequency in sexual assault survivors with PTSD

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Abstract

Sexual assault survivors with post-traumatic stress disorder (PTSD) were assessed for frequency of nightmares, measured retrospectively on the Nightmare Frequency Questionnaire (NFQ) and prospectively on nightmare dream logs (NLOG). Retrospective frequency was extremely high, averaging occurrences every other night and an estimated number of nightmares greater than five per week. Test–retest reliability data on the NFQ yielded weighted kappa coefficients of .85 (95% CI, .74–.95) for nights and .90 (95% CI, .83–.97) for nightmares. Correlations between retrospective and prospective nightmare frequencies ranged between .53 ($P = .001$) for nights and .63 ($P = .001$) for nightmares. Correlations between frequency and distress measures (anxiety, depression, post-traumatic stress) yielded coefficients ranging from ($r = .28$–.53). Compared with intrusive, cumbersome and time-consuming prospective measurements, the NFQ appears reliable, convenient, and equally useful in assessing nightmare frequency in a group of sexual assault survivors. Nightmare frequency, prevalence, distress and impairment are discussed.

Keywords: Nightmares; Post-traumatic stress disorder; Anxiety; Depression

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1. Introduction

Disturbing dreams and nightmares are prevalent in the general population (Bixler, Kales, Soldatos, Kales, & Healey, 1979; Bliwise, 1996; Klink & Quan, 1987) and occur in 60% of those diagnosed with post-traumatic stress disorder (PTSD) (Kilpatrick et al., 1998). With general population studies demonstrating lifetime prevalence rates for PTSD of at least 8 to 9% (Breslau, Davis, Andreski, & Peterson, 1991; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), disturbing dreams are more prevalent in PTSD than in any other mental health disturbance (Ross, Ball, Sullivan, & Caroff, 1989; van der Kolk, Blitz, Burr, Sherry, & Hartmann, 1984). Several randomized controlled investigations have also demonstrated that chronic nightmares are a directly treatable condition (Burgess, Gill, & Marks, 1998; Cellucci & Lawrence, 1978a; Kellner, Neidhardt, Krakow, & Pathak, 1992; Krakow, Kellner, Pathak, & Lambert, 1995a; Miller & DiPilato, 1983; Neidhardt, Krakow, Kellner, & Pathak, 1992) and that nightmares in PTSD patients can be targeted with focused treatments as well (Krakow et al., 2000).

Notwithstanding these developments in the field of nightmare research, *nightmare frequency*—presumably an essential variable for assessing a nightmare disorder—has received minimal attention and no standardization (Berquier & Ashton, 1992; Halliday, 1987; Hersen, 1971, 1972). Neither the *DSM-IV* (American Psychiatric Association, 1994) nor the *International Classification of Sleep Disorders* (American Sleep Disorders Association, 1991) mention frequency as a specific diagnostic criterion, although the ICSD (1991) describes three classes of nightmare sufferers according to frequency: mild, less than once per week; moderate, more than once per week, but less than nightly; and severe, nightly. According to ICSD (1991), these three classes denote an increasing degree of psychosocial impairment. The *ICSD* states that ''frequent nightmares (one or more a week) occur in perhaps 1% of the adult population.'' This opinion seems reasonable because nightmare sufferers rarely show up at clinics complaining of the disorder or seeking help primarily for bad dreams (Hartmann, 1984; Schreuder, van Egmond, Kleijn, & Visser, 1998); yet, such a view is not supported by prevalence data on chronic nightmares (Bixler et al., 1979; Bliwise, 1996; Klink & Quan, 1987; Wood & Bootzin, 1990).

Wood and Bootzin (1990) demonstrated that 19.5% of college students in an undergraduate psychology class reported a current problem with nightmares. They used a prospective assessment which yielded nearly twice the prevalence of another introductory psychology class (11%, Belicki & Belicki, 1982); almost three times the rate found in general population studies (6.9%, Bliwise, 1996; 8.1%, Klink & Quan, 1987); and, 20 times the rate listed in the ICSD (1%, ASDA, 1991). The position in the *DSM-IV*, (APA, 1994) is that ''actual prevalence of Nightmare Disorder is unknown.'' We suspect that the two general population studies with random sampling data collection methods, (Bliwise, 1996; Klink & Quan, 1987) demarcate the lower limit of prevalence for chronic, problematic nightmares.

In all these studies, nightmare frequency was measured through self-report, which has developed as the most common form of assessment because polysomnographic evaluations (sleep studies) are cost-prohibitive; and, more importantly, nightmare sufferers studied in a laboratory setting often do not report episodes (Hartmann, 1970). Self-reports have been retrospective in most prevalence studies, many of which have targeted the measure *number of nights* of nightmares (Bixler et al., 1979; Bliwise, 1996; Halliday, 1987; Klink & Quan, 1987); three controlled treatment studies have assessed *number of nightmares* (Cellucci & Lawrence, 1978a; Krakow et al., 1995a; Miller & DiPilato, 1983). One prevalence study (Wood & Bootzin, 1990) and one descriptive report (Schreuder et al., 1998) have assessed *number of nightmares* prospectively.

As cited, frequency has a limited role in current nosology (ASDA, 1991; APA, 1994) of chronic nightmare disorder. The *DSM-IV* (1994) and the *ICSD* (1991) nosologies are further limited by narrowly defined criteria which emphasize the term *frightening* in the description of a disturbing dream and that the dreamer ''usually awakens'' from the episode. Despite this view, there is no evidence that chronic nightmare sufferers invariably awaken from their bad dreams (Cellucci & Lawrence, 1978b; Haynes & Mooney, 1975) or even complain of nighttime awakenings (Krakow, Tandberg, Barey, & Scriggins, 1995b). Nightmare sufferers also report many other negative emotions besides fright (Perlis, Warbasse, & Bootzin, 1990), notably anxiety. As such, patients (and possibly clinicians) are not sure what to call disturbing dreams—nightmares, anxiety dreams, bad dreams, unpleasant dreams, or frustrating dreams—and this may lead to a lack of recognition of nightmare or anxiety dream disorders.

Neither diagnostic manual (ASDA, 1991; APA, 1994) sufficiently addresses nightmare distress which, at a minimum, must also be accounted for in the nosology of chronic nightmare disorder. *Distress* evolves from attribution: ''Do your nightmares bother you?'' Belicki (1985) has formalized this concept with a 13-item scale, the Nightmare Distress Questionnaire (NDQ). Her work implies that nightmares can be viewed *categorically* (presence or absence) based on the finding of a modest correlation ($r = .33$) between nightmare frequency and nightmare distress (Belicki, 1985, 1992a, 1992b). Wood and Bootzin (1990) demonstrated a similar correlation ($r = .39$) in prospective dream logs although, in the same study, retrospectively recalled frequency correlated higher with nightmare distress ($r = .60$). Further, neither prospective nor retrospective data showed any relationship between measures of anxiety and nightmare frequency in the Wood and Bootzin (1990) research, a finding discordant with other literature (Berquier & Ashton, 1992; Cellucci & Lawrence, 1978b; Haynes & Mooney, 1975).

The Wood and Bootzin study (1990) has also provided a new perspective on the use of frequency in prevalence assessments of a nightmare disorders. They observed that retrospective reporting underestimates nightmare frequency; thus, they postulated that prevalence of nightmare disorders has been underestimated as well. College students completing prospective, two-week dream diaries detailed nightmare frequencies greater than twice that noted on retrospective self-reports.

If *retrospective* nightmare frequency had been the sole determinant of a nightmare problem, only 10 of the 220 participants would have met the commonly used criteria of one nightmare per week (Hersen, 1971, 1972). But 43 of the 220 claimed that they had a problem with nightmares (a rate of 19.5%); and, their *prospective* dream log data implies that all 43 suffered from a frequency of once per week or greater. By comparison, Schreuder et al. (1998) investigated PTSD patients and reported a strong correlation between retrospective nightmare frequency measured on the Clinician-Administered PTSD Scale (Blake et al., 1990) and serial reports of nightmares collected for 28 consecutive days.

Despite the growing interest in nightmare research, there are no published data on test–retest reliability for any instrument used to measure nightmare frequency; and, there is only limited information available to support the use of intrusive, cumbersome and time-consuming prospective assessments of frequency in place of simpler, easier and less intrusive retrospective measures. Clarity is also still lacking about the relationship between nightmare frequency and measures of distress and impairment. The current study investigated nightmare frequency in a group of sexual assault survivors with PTSD in order to:

1. Establish the test–retest reliability of the NFQ—a two-part, retrospective, self-report instrument measuring frequency as a continuous variable in two ways: *nights (with nightmares) per unit of time* and *nightmares per unit of time*.
2. Correlate findings from the retrospective NFQ with prospective nightmare dream logs (NLOG).
3. Assess correlations between nightmare frequency and nightmare distress, nightmare impairment, post-traumatic stress symptoms, anxiety and depression.

2. Methods

2.1. Subjects

The study was approved by the Human Research and Review Committee of the University of New Mexico Health Sciences Center. All participants provided oral and written consent. Women who complained of chronic nightmares and a history of sexual or physical assault were recruited from the general population through various mechanisms: 20% from the Albuquerque Rape Crisis Center, 6% from University Hospital (the emergency room or sleep disorders clinic), 7% from the University Mental Health Center, 23% from local, private therapists, and 44% self-referred from flyers, newspaper advertisements or articles. All participants had been the victim of sexual (95%) or physical (5%) violence. Ninety-four percent met criteria for PTSD on the Clinician-Administered PTSD Scale (Blake et al., 1990).

The mean duration of a chronic nightmare disorder in these sexual assault survivors was 19 years. On average, they rated the severity of their problem with disturbing dreams in the moderate to severe range. Only 14 participants had ever sought help for the problem of nightmares and essentially all these women sought it in the context of psychotherapy for other psychiatric symptoms. Seventy-seven percent recalled a specific event(s) that they believe had precipitated the disturbing dreams.

The mean age of the group was 37.5 years, and their mean household income ranged between $10,000 and $20,000. Their mean level of education was some college or technical-vocational training. Of these, 25% were married, 26% divorced, 31% single, 18% living with a partner or other categories; 16% were Hispanic, 3% Native American, 81% Anglo.

2.2. Measures

Data was obtained from psychometric instruments that were completed by the sample of trauma survivors prior to enrolling in a nightmare treatment program. These intervention results are reported elsewhere (Krakow et al., 2000). Nightmare distress, nightmare impairment, nightmare frequency, post-traumatic stress, anxiety and depression were assessed.

The NDQ, developed by Belicki (1992b), includes 13 items rated on a five-point scale to assess the degree of self-reported distress attributed to nightmares. Reliability was measured using Cronbach's alpha with results ranging from .83 to .88. Nightmare distress was significantly correlated with interest in therapy for nightmares.

The Nightmare Effects Survey (NES) includes 11 items (sleep, work, relationships, daytime energy, school, mood, sex life, diet, mental health, physical health, leisure activities) rated on a five-point scale to assess the self-reported degree of impairment attributed to nightmares. Belicki, Chambers, and Ogilvie (1997) reported correlations of $r = .70$ and $r = .54$ between the NDQ (described above) and the NES.

The NFQ is a self-report, two-question retrospective survey that estimates the number of nights in which nightmares occur on a yearly, monthly, weekly or nightly basis, and the number of nightmares for the same time intervals. Space is provided to estimate nightmare counts greater than once per night (Appendix A).

The PTSD Symptom Scale (PSS) is an instrument developed by Foa, Riggs, Dancu, and Rothbaum (1993) that measures PTSD symptoms according to the *DSM-III-R* (American Psychiatric Association, 1987) criteria. It can be administered as a self-rated scale (PSS-SR) or as an interview (PSS-I). The PSS-I, used here, consists of a 17-item, semi-structured interview that evaluates the severity of PTSD symptoms as experienced by the patients in the preceding two-week period. The PSS contains three subscales of symptoms, including intrusion symptoms (e.g., nightmares, flashbacks), avoidance symptoms (e.g., avoiding places or activities, feelings of detachment from others), and arousal symptoms (e.g., sleep

disturbances, increased physiological reactivity). Foa et al. (1993) reported reliability as determined by Cronbach's alpha of .85 for the overall scale. Alpha coefficients for the symptom cluster subscales were as follows: re-experiencing, .69; avoidance, .65; and arousal, .71. The total severity score showed significant correlations with other measures of psychological distress.

The Hamilton Anxiety Scale (HAM-A), developed by Hamilton (1959), is a 14-item, semi-structured interview that assesses the severity of anxiety symptoms. An interviewer rates each of 14 clusters of symptoms on a five-point scale. Kobak, Reynolds, and Greist (1993) found that the internal consistency of the total scale was .92 as assessed by Cronbach's alpha in a sample of individuals with anxiety disorders, individuals with depression, and individuals with no diagnosis. The HAM-A correlated significantly with other measures of anxiety (Schutte & Malouff, 1995).

The Hamilton Depression Rating Scale (Hamilton, 1960, 1967) was developed to measure the severity of depression in individuals already diagnosed as suffering from depressive disorder (Schutte & Malouff, 1995). In two studies described by McNamara (1992), item-total correlations ranged from .21 to .78. In two other studies reported by Bech and Rafaelsen (1980), item-total correlations ranged from virtually 0 to .91. Scores of the scale have been found to correlate .58 to .84 with scores on other measures of depression and with global ratings of depression by psychiatrists.

2.3. Procedures and data collection

Research participants were instructed to define nightmares and disturbing dreams in a broad sense that might include terms such as nightmares, anxiety dreams, bad dreams, unpleasant dreams, or frustrating dreams. Awakening from the dreams was not a requirement. They were instructed to count any dream that was unpleasant or disturbing.

One hundred and forty-two women completed the intake interview. From this sample, 34 consecutive participants were selected to complete the NFQ twice with approximately a 2-week interval between the first (pre-intake = PRE-NFQ) and second (intake = INT-NFQ) assessment.

All 142 participants who completed NFQs at intake were instructed to complete prospective measures of nightmare frequency on a daily basis with NLOGs. These were compiled during a 2-week period following the intake interview and then were mailed back to the investigators. To avoid potential confounding due to re-stimulation processes common among PTSD patients (Litz, Blake, & Gerardi, 1990; Neidhardt et al., 1992), no additional efforts were made to verify that patients completed the logs on a daily basis. Of the 142 returned logs, 35 were excluded from analysis because of missing or illegible data. The prospective data from the 107 usable NLOGs were compared with their matched retrospective data from the participant's intake NFQ. Based on the retrospective data, there were no significant differences in nightmare frequency or

Table 1
Questionnaires and variables at baseline intake evsaluation[a]

Variables	Study patients			Normative data or scale used
	n	Mean	S.D.	
Nightmare Distress Questionnaire (NDQ)	125	29.06	6.56	Score range: 0–56
Nightmare Effects Survey (NES)	125	25.00	8.73	Score range: 0–44
				Mean (S.D.) scores for PTSD points
PTSD Symptom Scale: interview version (PSS-I)				
PSS-1 (intrusion)	123	6.43	3.18	8.89 (3.67)
PSS-2 (avoidance)	124	11.32	5.31	13.57 (4.77)
PSS-3 (arousal)	124	11.57	4.14	11.05 (3.52)
PSS-total	123	29.32	10.96	33.58 (9.94)
Hamilton Anxiety Rating Scale (anxiety)	93	24.09	8.31	Median: severe anxiety = 25 (25th–75th percentile: 14.5–37)
Hamilton Depression Rating Scale (depression)	99	24.85	8.53	Severe depression: >22

[a] Higher scores reflect greater distress.

any of the measures of distress between the groups who provided the 107 usable versus the 35 non-usable NLOGs.

2.4. Statistical analysis

Test–retest reliability was measured both by Pearson product moment correlations and by weighted kappa statistics calculated on pre-intake and intake values of the NFQ (Bland & Altman, 1986). Correlations on both nights and nightmare count from the retrospective NFQ and their counterparts on the prospective NLOGs were calculated. Correlations were obtained between all measures of nightmare frequency (NFQ and NLOG) and the various measures of distress, including nightmare distress (NDQ), nightmare impairment (NES), post-traumatic stress (PSS-I) (PTSD total severity and intrusion, avoidance, and arousal components) anxiety (HAM-A) and depression (HAM-D) (Harris, 1975). Baseline data are provided in Table 1 with means (S.D.) and normative data as applicable for all measures used in the correlational analysis.

3. Results

Test–retest reliability correlations between Time 1 and Time 2 for nightmare frequency yielded high coefficients for both nights and nightmares with similar results obtained for weighted kappa statistics (Table 2).

Table 2
Test–retest reliability correlations to NFQ

Characteristics	Nights/week	Nightmares/week
n	34	33
Pre-intake frequency (mean and S.D.)	3.33 ± 2.32	5.21 ± 3.84
Intake frequency (mean and S.D.)	3.80 ± 2.19	5.63 ± 4.25
Correlation coefficient	.90 (95% CI, .84–.96)	.86 (95% CI, .76–.95)
Weighted kappa	.85 (95% CI, .74–.95)	.90 (95% CI, .83–.97)

Table 3
Correlation analyses between retrospective versus prospective assessment of nightmare frequency[a]

Nights/week (retrospective)	Nightmares/week (retrospective)	Nights/week (prospective)	Nightmares/week (prospective)
Nights/week (retrospective) *r*	.80*	.60*	.60*
Nightmares/week (retrospective) *r*		.53*	.63*
Nights/week (prospective) *r*			.72*

[a] $n = 107$.
* *P*-value = .001.

Prospective–retrospective analysis yielded correlations ranging between .53 and .63 (Table 3). There was a clear tendency toward lower values on the retrospective NFQ. The exact predictive equation (the regression coefficient) revealed the specific adjustment (NFQ value × .74 + 3.6 = number of nightmares predicted for the NLOG). The equation indicates that an individual with extremely high nightmares (greater than 14/week) would report lesser frequencies on the NLOG than on the NFQ; however, this would have been true for only eight participants while essentially most others reported lower values on the NFQ (thus

Table 4
Correlation analysis for frequency measured in nights and nightmare count both retrospectively and prospectively with 8 variables for distress and impairment

Variables	*n*	NTS/W (retrospective)	NMS/W (retrospective)	NTS/W (prospective)	NMS/W (prospective)
Nightmare distress	125	.31**	.37*	.17	.30**
Nightmare effects	125	.52*	.47*	.27	.43*
PSS-1	123	.48*	.46*	.53*	.49*
PSS-2	124	.37*	.36*	.36**	.34**
PSS-3	124	.44*	.45*	.34**	.40*
PSS-total	123	.49*	.48*	.46*	.46*
Anxiety	93	.29	.28	.33	.37**
Depression	99	.38*	.35**	.30	.39**

NTS/W: nights per week; NMS/W: nightmares per week.
* *P*-value = .0001.
** *P*-value = .001.

higher values on the NLOG). The correlations between nights and nightmares within each instrument ranged from .72 to .80 (Table 3).

Correlations between nightmare frequency and distress measures are provided in Table 4. Nightmare frequency measured in nights and nightmares per week on both retrospective and prospective assessments yielded numerous significant moderate correlations. For the 32 possible correlations, a simple Bonferroni correction revised the significance level to $P = .002$ after which 26 correlations remained significant (Table 4).

4. Discussion

Retrospective evaluation of nightmare frequency in sexual assault survivors with PTSD appears to offer a convenient methodology compared with prospective evaluations. Test–retest reliability was demonstrated for a simple retrospective instrument (NFQ) and the correlation between retrospective values and prospective ones were in the moderate to high range. Of further interest, retrospective and prospective measures of nightmare frequency correlated similarly with measures of distress and impairment; and, the frequency measures of nights and nightmares generally provided similar correlations as well. The two distress measures that were directly linked to attributions about nightmares (NES: effects on psychosocial functioning or impairment, and NDQ: distress attributed to nightmares) yielded correlation coefficients ranging from .17 to .52 with impairment (NES) attaining the highest associations ($r = .47$–$.52$) on the retrospective analysis. Coefficients for anxiety, depression and PTSD ranged from .28 to .53, with the highest associations observed for intrusion and total PTSD severity ($r = .46$–$.53$) on both retrospective and prospective analyses.

A reliable instrument for measuring nightmare frequency provides clinicians and researchers a simple tool for assessing changes over time due to therapeutic intervention or demand characteristics. And, given the compliance problems we have observed when chronic nightmare patients attempt to complete dream diaries (Neidhardt et al., 1992), assessing nightmare frequency with a two-question instrument may be a much simpler way to acquire pertinent research and clinical data. In this study, 25% did not complete the NLOG. Prior researchers who successfully used dream diaries have often included a large number of non-nightmare patients in their studies (Wood & Bootzin, 1990) or, in some cases, have relatively captive audiences, such as a class of undergraduate psychology students (Cellucci & Lawrence, 1978a). Smaller samples with more intensive compliance programs have also successfully utilized prospective assessments (Schreuder et al., 1998) in research protocols, but it remains unclear to what extent such protocols confound results by inducing more nightmares in patients highly susceptible to re-stimulation. In fact, the primary reason given for non-participation in the Schreuder et al. (1998) study was a feared increase in nightmare frequency.

The correlation between retrospective and prospective assessments, like the work of Wood and Bootzin (1990), reveals lower frequencies for the former. Nonetheless, in our PTSD sample, we cannot discern any clinical or research advantage to emphasize prospective over retrospective assessment because both assessments correlated well with distress. These results also suggest that nightmares, when viewed as a continuous variable, may provide clinically useful information for assessing sexual assault survivors with disturbing dreams, i.e., increased nightmare frequency, in applicable patients, may be associated with increased levels of anxiety, depression and PTSD. To be sure, this does not preclude the utility of a qualitative or categorical assessment (presence or absence of nightmares) with other types of patients.

It may seem axiomatic that nightmare frequency and distress measures would correlate in a sample of sexual assault survivors; however, these associations may not always be apparent or appraised in the clinical setting. Furthermore, nightmares, and specifically frequency of nightmares, are likely to impact on other aspects of the post-traumatic stress process. We speculate that nightmare frequency and possibly nightmare intensity are integral components of the psychophysiological process imbedded within the hyper-arousal insomnia so commonly observed in PTSD patients who suffer concomitant disturbing dreams. More frequent nightmares could serve as repetitive catalysts to undermine sleep continuity which would then fuel the psycho-physiological or conditioning aspects (ASDA, 1991) of the insomnia in PTSD patients. Knowing more about this potential relationship may provide new and important therapeutic options. For example, direct treatment of nightmares with cognitive-behavioral methods has been associated with a reduction in anxiety and sleep complaints in chronic nightmare sufferers without PTSD (Krakow et al., 1995a, 1995b), and with improvement in PTSD symptoms (intrusion, avoidance and arousal) in a sample of sexual assault survivors (Krakow et al., 2000). In the current study, nightmare frequency correlated highest with PTSD intrusion [similar to the Schreuder et al. (1998) findings] which to reiterate, may be clinically useful information when considering target-specific therapies for PTSD.

The correlations noted for anxiety, depression, PTSD subscales, and total PTSD severity demonstrated a consistent pattern, explaining 8 to 28% of the variability. It is unclear why the Wood and Bootzin (1990) study did not manifest these associations for anxiety measures. Berquier and Ashton (1992) noted that the preponderance of individuals in the Wood and Bootzin study were not chronic nightmare sufferers, and the most severe nightmare sufferers were excluded from the analyses; thus, ‘‘it is possible that correlations between nightmare frequency and anxiety were artificially reduced by this strategy.’’

In the fields of dream research and sleep disorders medicine, we often encounter and treat chronic nightmare sufferers; therefore, we offer a brief comment about our anecdotal experience and how it integrates with the findings of this research. The diagnosis of a chronic nightmare disorder can often be established with a few questions:

- Do you have frequent nightmares?
- Do your bad dreams bother you?
- How much do they bother you?
- Would you like to treat your nightmares to reduce or eliminate them?

The last question was an important consideration in Belicki's construction of the NDQ (1985) and supports the value of a very simple, categorical assessment of the problem. Such questions may or may not evoke a trauma history which, if disclosed, is of particular clinical interest because, often times per patient report, such disclosures have not been provided previously to a mental health professional. Assessing nightmare frequency with greater precision in the clinical setting proves most useful for those with more nightmares, which would be expected from the correlations in this study. Clinically, those with a higher frequency of bad dreams usually denote chronic nightmare sufferers *with* PTSD and many suffer from moderate to severe insomnia—often their presenting complaint. From a sleep medicine perspective we think it is interesting that some of these patients find it easier or less threatening to broach the topic of sleep first, nightmares second and then possibly post-traumatic stress, as applicable. And, these same patients are more eager to, once again, treat their sleep first, their nightmares second and finally their PTSD (usually trailing a very distant third). Thus, in our clinical experience, assessing the problem of nightmares and obtaining information on nightmare frequency in sexual assault survivors (and perhaps other trauma survivors) may offer an opportunity to engage an individual who might otherwise avoid any form of professional help for mental health symptoms such as post-traumatic stress.

The study has several limitations. All patients reported that their nightmares were a problem because women with post-traumatic stress were recruited specifically to treat their bad dreams. Therefore, the sample would be expected to suffer distress. As such, correlations between nightmare frequency and distress and impairment may be valid, but only for this sample of sexual assault survivors and not generalizable to other types of chronic nightmare sufferers. Indeed, inconsistencies in distress correlations observed in other studies suggest that nightmares and nightmare frequency may have variable associations with different populations of nightmare sufferers. The work of Schreuder et al. (1998) may offer some explanation for these inconsistencies because they demonstrated correlations between PTSD symptoms and anxiety dreams *with* awakenings (nightmares) versus anxiety dreams *without* awakenings (anxiety dreams). The current study did not assess this distinction, nor have other studies that had examined the relationship between nightmare frequency and distress. Future research using the paradigm of Schreuder et al. (1998) may provide more definitive information about this relationship.

Last, there are problems inherent in prospective recording without adequate monitoring. Did patients fill in their data all at once, in sporadic fashion, or did they record on a daily basis? While specific monitoring techniques have been described to insure the integrity of this process (Lacks, 1988; Stone, Kessler, &

Haythornthwaite, 1991), such relative intrusiveness could: hamper an investigation in a sample of PTSD patients; lead to an increase in nightmares and PTSD symptoms in some patients; and may be perceived as an unethical research design for traumatized individuals who already have considerable issues surrounding trust and privacy. Prospective tracking of nightmares may also produce variable effects on nightmare frequency in chronic nightmare sufferers. We demonstrated a therapeutic effect in a group of chronic nightmare patients without PTSD who recorded their disturbing dreams (Neidhardt et al., 1992), but we have observed anecdotally an increase in nightmare frequency in a few PTSD patients who prospectively tracked their dreams. Trauma survivors are susceptible to re-stimulation which can induce a new cycle of re-experiencing. This is described in the exposure treatment literature and accounts for one of the likeliest reason for dropout from a desensitization program (Litz et al., 1990; Pitman et al., 1991). Asking such patients to record nightmare frequency may induce rumination on their disturbing dreams. This re-stimulation may trigger more nightmares, thus creating the impression that prospective recording yields a higher measurement while retrospective reporting yields lower values. Similarly, in our design, it is possible that the intensity of the intake interview could have produced sufficient stimulation to have affected the subsequent 2-week period during which the prospective log was compiled. Thus, for chronic nightmare patients, prospective monitoring may affect experimental design and confound subsequent results. Moreover, recent research indicates that retrospective assessments may provide more clinically useful information than serial prospective monitoring, for example, when measuring changes in outcomes over time (Fischer, Stewart, Bloch, Lorig, Laurent, & Holman, 1999).

In summary, the findings need to be interpreted in the context of the focused sample upon which the research was designed. The results may not be generalizable beyond our specific sample of sexual assault survivors with PTSD, for whom we note the following:

1. Retrospective assessment of nights and nightmares using the NFQ is a convenient and reliable way to quantify nightmares.
2. There appears to be little clinically meaningful difference between retrospective and prospective assessment of nightmare frequency.
3. Nightmare frequency correlates moderately with anxiety, depression, nightmare distress, and more strongly with post-traumatic stress and nightmare impairment.

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Appendix A. Nightmare Frequency Questionnaire

Name_____ ID#_____ Date_____

A.1. Frequency of nightmares and disturbing dreams

Part I: Frequency by number of nights.

Based on the previous three months, please estimate on *average* how often you experience nightmares and disturbing dreams by selecting *one* of the following categories based on *number of nights*.

Select only one column from the four listed, then circle only *one* category:

Zero	Yearly	Monthly	Weekly
0 nights	1 night per year	1 night per month	1 night per week
	2 per year (1 per 6 months)	2 nights per month	2 nights per week
	3 per year (1 per 4 months)	3 nights per month	3 nights per week
	4 per year (1 per 3 months)		4 nights per week
	5 per year		5 nights per week
	6 per year (1 per 2 months)		6 nights per week
	7 per year		7 nights per week
	8 per year		
	9 per year		
	10 per year		
	11 per year		

Part II: Frequency by actual number of nightmares and disturbing dreams.

Based on the previous three months, please estimate on *average* how often you experience nightmares and disturbing dreams by selecting *one* of the following categories based on the *actual number.*

Select only one column from the four listed, then circle only *one* category:

Zero	Yearly	Monthly	Weekly
0 nightmares	1 nightmare per year	1 nightmare/month	1 nightmare/week
	2 per year (1 per 6 months)	2 per month	2 per week
	3 per year (1 per 4 months)	3 per month	3 per week
	4 per year (1 per 3 months)		4 per week
	5 per year		5 per week
	6 per year (1 per 2 months)		6 per week
	7 per year		7 per week
	8 per year		__ per week[a]
	9 per year		
	10 per year		
	11 per year		

[a] If your total number of nightmares and disturbing dreams is more than 7 per week, please *estimate on average* the actual number for a typical week and *fill in the blank*. (For example, some people have *more* than one nightmare or disturbing dream in a single night. They may report 2 disturbing dreams per night for 7 nights in the week. Their total number of nightmares per week would be 2 nightmares $\times$ 7 nights $=$ 14.)

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