Sleep Disturbances and Their Association With Mental Health Among Women Exposed to Intimate Partner Violence

Wilfred R. Pigeon, Ph.D.,^{1,2,3} Catherine Cerulli, J.D., Ph.D.,² Heidi Richards, M.S., M.F.T.,⁴
Hua He, Ph.D.,⁵ Michael Perlis, Ph.D.,⁶ and Eric Caine, M.D.²

Abstract

Background: Intimate partner violence puts the victim at risk for substantial medical and psychiatric morbidity. As with other stress- and trauma-related experiences, intimate partner violence is associated with sleep disturbance, particularly insomnia and nightmares. This association, however, has not been well characterized in terms of general prevalence or its further relationship with depression, suicidality, and posttraumatic stress disorder (PTSD).

Methods: The present study used validated instruments to characterize insomnia and nightmares among 121 women exposed to intimate partner violence. Participants with and without depression were compared on demographic, abuse, and sleep characteristics as were those with and without suicidality. Logistic regression models were constructed to test sleep variables as independent predictors of depression controlling for demographic factors, abuse severity, and PTSD severity.

Results: Clinically significant insomnia and nightmares were observed in 46% and 32% of participants, respectively. Depressed women had more severe PTSD and were more likely to have insomnia and to have nightmares than nondepressed women. In models controlling for PTSD severity, the presence of insomnia was associated with an approximately eightfold greater risk of being depressed; nightmares were associated with a twofold increase in risk.

Conclusions: Sleep disturbances were prevalent among women experiencing intimate partner violence, with both insomnia and nightmares predicting the presence of depression even after controlling for PTSD severity. In addition to the need to address common mental health issues such as depression, given that sleep problems are modifiable and potentially less stigmatizing than mental health problems, assessing and addressing insomnia and nightmares in survivors of interpersonal violence warrants strong clinical consideration and further investigation.

Introduction

INTIMATE PARTNER VIOLENCE (IPV) is a public health issue. Approximately 20% of individuals who responded to a national telephone survey reported IPV.¹ Abuse ranges have been reported to be greater than 44% nationally and abroad.²⁻⁵ The abuse can be physical, psychological, or sexual. However, all three types of abuse are known to result in negative health consequences.⁶⁻⁹ Mental health consequences of IPV include depression, anxiety, posttraumatic stress disorder (PTSD),

and chronic fatigue.^{10,11} Suicidal ideation and suicide attempts are more prevalent for those who report being victimized than those who report no IPV.¹² Approximately half of the women admitted for inpatient psychiatric care in the wake of suicide attempts, disclose IPV.¹³ Thus, both the epidemiology of and the clinical relationships between IPV and its mental health consequences have been studied.

One area that has received more limited attention in the IPV literature is the issue of sleep disturbance. Moreover, the intersection of IPV, mental health, and sleep disturbance has been

¹Center of Excellence for Suicide Prevention, Canandaigua VA Medical Center, Canandaigua, New York.

²University of Rochester Medical Center, Department of Psychiatry, Rochester, New York.

³University of Rochester Medical Center, Sleep & Neurophysiology Research Laboratory, Rochester, New York.

⁴Private Practice.

⁵University of Rochester Medical Center, Department of Biostatistics & Computational Biology, Rochester, New York.

⁶Behavioral Sleep Medicine Program, University of Pennsylvania, Philadelphia, Pennsylvania.

largely ignored. This is an important intersection given the potential impact of sleep disturbance on decision-making and self-care, especially for victims navigating the court systems who need to make decisions related to safety, visitation, and custody.

There is a sizable literature demonstrating a strong relationship between sleep disturbances and mental health.¹⁴ The strongest and most striking of this evidence exists with respect to depression and insomnia, which frequently co-occur in all cohorts, but especially in older adults and in women (including in women of childbearing age who are also at risk for depression).¹⁵ Although, it is perhaps best viewed as a bidirectional relationship, a number of longitudinal studies support the designation of insomnia as a risk factor for the development or maintenance of depression with some indications that this risk is stronger in women (including in women of childbearing age who are at increased risk for depression).¹⁶ In addition, sleep disturbances have historically been considered a hallmark of PTSD.¹⁷ In the broader literature, ample data underscore a strong association between trauma exposure or PTSD and nightmares,¹⁸ whereas insomnia (difficulty initiating or maintaining sleep) is the most commonly endorsed symptom among PTSD patients.¹⁹ Insomnia occurs in 60–90% of patients with PTSD, whereas approximately 50% report nightmares.²⁰ Nightmares and insomnia were each independently associated with PTSD in a trial used to establish DSM-IV PTSD criteria²¹ and have even been found to be risk factors for developing PTSD.²² Finally, both insomnia and nightmares have been identified as risk indicators for suicidality and suicide.²³

Despite studies characterizing associations between IPV and mental health issues and between mental health issues and sleep disturbances, there are somewhat limited data examining sleep in the context of IPV victimization. Data that do exist suggest that IPV victims experience high rates of sleep disturbances.^{24,25} Uncontrolled studies report frequent complaints of nightmares^{26,27} and fear of sleep²⁴; in population-based surveys victims report more difficulty getting enough sleep than IPV-negative women.²⁸ In a controlled investigation that included objective measures of sleep, battered women in transitional housing had poorer sleep than healthy controls.²⁹ These seminal publications alert us to the prevalence and importance of sleep disturbances in IPV victims and call for additional inquiry using validated measures. These studies also call for investigation of the sleep–IPV–mental health connection, given that sleep disturbances, depression, and PTSD are treatable conditions with evidence-based interventions.

The current study expands the nascent literature addressing sleep and IPV in four important ways by (1) incorporating community-based participatory research principles; (2) conducting the study among an IPV court-based sample; (3) utilizing a validated sleep instrument (the Insomnia Severity Index [ISI]^{30,31}) to characterize sleep disturbances; and (4) assessing whether nightmares and insomnia were associated with either depression or suicidality controlling for socio-demographic and/or clinical factors. Policy and clinical implications for the findings are discussed.

Materials and Methods

Procedures

The current study is grounded in principles of community-based participatory research.^{32,33} The tenets of this method-

ology suggest that along the spectrum of community work—community based, community partnered, and community participatory—the latter exists when a community partner poses the research question and the clients participate in the conceptualization and design of the study. Prior to the current study, the executive director of a large domestic violence agency, which included a hotline, 38-bed shelter, transitional services, court advocacy, and community-based support group, approached the authors with a dilemma. It appeared that many of the women served by her agency complained of sleep disturbance issues: insomnia, nightmares, restlessness, and waking from a full night's sleep feeling exhausted. She had combed the literature but was unable to find either an intervention to target this complaint among IPV victims or any literature characterizing sleep issues among IPV victims.

Contemporaneously, the agency's court-based advocates were observing judges' comments on their clients' court-based behavior. The judges expressed confusion over why the behavior of some victims testifying about horrific abuse seemed "flat and detached." Following testimony, victims would often weep in the waiting room. When approached by advocates with assurances that all would be well, the women responded—"I am okay, I am just so tired." These two issues spurred a partnership between our university and representatives from the shelter.

The resulting cross-sectional study recruited women from a private waiting room in a New York State family court from May 2007 to January 2008. After filing for a civil court protection order against an intimate partner and having the opportunity to meet with a domestic violence advocate for safety planning, women were approached with verbal study information. Following written informed consent, the women were enrolled in the study and completed initial study questionnaires. A second set of questionnaires was completed approximately 2 weeks later. This study was reviewed by and approved by the University of Rochester Research Subjects Review Board.

Participants

Of 380 women approached with information about the study for the purpose of recruitment, 190 women enrolled in the study (a 50% response rate). Our sample consists of women who completed the additional questionnaires including a validated insomnia instrument approximately 2 weeks after the initial assessment ($n = 121$; a retention rate of 64%). These participants were ethnically diverse and young to middle-aged (see Table 1), although their ages ranged from 19 to 82 years old. Participants did not differ in age or race/ethnicity from those who declined participation or did not complete our sleep instrument.

Inclusion criteria included being a female, over the age of 18, and filing against an intimate partner for a protection order. The participants were English speaking and able to read at a fifth grade level. There were no inclusion criteria that focused on the length of the relationship, the severity of the violence, or resulting health problems.

Members of the research team approached participants in a locked, secure waiting room to inquire whether the participant was interested in learning more about a study. Once the study was explained and interest confirmed, the participant had the opportunity to read the informed consent and provide

TABLE 1. SOCIO-DEMOGRAPHIC, TRAUMA, AND SLEEP CHARACTERISTICS OF THE SAMPLE AND FOR PARTICIPANTS WITH AND WITHOUT DEPRESSION

Characteristic	Sample (N = 121)	Depression (n = 61)	No depression (n = 60)	p value ^a
Demographic				
Age, mean (sd)	34.6 (10.7)	37.0 (12.3)	32.1 (8.2)	0.014
Race, n (%) ^b				
White, non-Hispanic	51 (42.1)	25 (41.0)	26 (43.3)	0.854
Non-white	68 (57.9)	35 (54.10)	33 (55.0)	
Black, non-Hispanic	44 (36.4)			
Hispanic	20 (16.5)			
Asian	2 (1.7)			
Other	2 (1.7)			
Unknown	2 (1.7)			
Employed, n (%)	74 (61.2)	32 (52.5)	42 (70.0)	0.062
Living in poverty, n (%)	29 (24.0)	15 (24.6)	14 (23.3)	0.830
Trauma, mean (sd)				
Violence severity ^c	15.8 (8.9)	16.8 (9.8)	14.8 (7.7)	0.429
PTSD severity ^d	49.3 (30.8)	65.7 (25.9)	31.3 (20.9)	<0.0001
PTSD severity minus sleep	44.1 (27.3)	58.4 (25.9)	28.5 (18.9)	<0.0001
Sleep disturbance, n (%)				
Insomnia severity index > 10	56 (50.1)	45 (73.8)	11 (18.3)	<0.0001
Nightmare disturbance ^e	39 (32.2)	33 (54.1)	6 (10.0)	<0.0001

^ap values are from *t*-tests for continuous variables and chi-square tests for dichotomous variables.

^bTwo Hispanic participants also endorsed black and the other endorsed white. Two American Indian/Native Alaskan participants also endorsed black, 1 also endorsed white and the other endorsed only American Indian/Native Alaskan.

^cTotal score from the Conflict Tactics Scale-2.

^dTotal score from the Modified PTSD Symptom Scale with an without the insomnia and nightmare items. PTSD, posttraumatic stress disorder.

^eNightmare disturbance defined as ≥ 1 nightmare per week and a severity of ≥ 2 .

written consent. The participant received a grocery store gift certificate as a thank you. Interviews consisted of self-report surveys.

Measures

At the initial assessment participants completed a socio-demographic inventory and a number of self-report instruments described below.

The Modified PTSD Symptom Scale (MPSS)³⁴ is a 17-item self-report measure that assesses both the frequency and severity of post-traumatic stress symptoms within the previous 2 weeks. The questionnaire uses a scale of 0–3 to rate frequency of symptoms and a 0–4 scale to rate severity of symptoms; total scores range from 0–119 with a validated cutoff of 46 used to identify clinically meaningful PTSD.

Nightmares were assessed by the MPSS nightmare frequency and severity items. These two items were summed to derive a nightmare severity score. In addition, using the “1–2 rule” (>1 nightmare per week and a severity of >2),³⁵ the sample was dichotomized into those with and without nightmare disturbance.

The Conflict Tactics Scale-2 Short (CTS2)^{36,37} is a 20-item measure modified from a 39-item self-report scale that assesses relationship negotiation, psychological aggression, physical assault, sexual coercion, and injury. The original CTS2 39 pair-item questionnaire demonstrated high reliability coefficients, which were retained in the current version.^{36,37} The CTS2 total score ranges from 0 to 60.

The Center for the Epidemiologic Studies Depression Scale (CESD)³⁸ is a 20-item scale assessing criteria for major depression. Each item is coded from 0 (“not at all or less than one

day”) to 3 (“five to seven days” or “nearly every day for two weeks”) so that scores range from 0 to 63. A cutoff of 16, which has been validated as an indicator of significant depression, was used to dichotomize the sample for analyses. The CESD was re-administered 2 weeks later and only scores from this latter administration were used in analyses.

The ISI^{30,31} is a validated seven-item scale that assesses difficulty initiating and maintaining sleep, the daytime consequences of lack of sleep, worry about sleep, and satisfaction with sleep quality on a scale of 0–4. The summed score on the instrument can be categorized into no, mild, moderate, and severe insomnia or a score of >10 (as used in many insomnia clinical trials) can capture clinically significant insomnia. The latter cutoff was used to dichotomize the sample into those with and without insomnia. The ISI was administered approximately 2 weeks after the initial assessment.

Suicidality was assessed by asking once about the frequency of suicidal thoughts with a range of 0–3. Any level of endorsement of suicidality (i.e., >1) was used to dichotomize the sample into those with and without suicidality.

Data analysis

Group differences on demographic, trauma, and sleep characteristics between participants with and without depression, were assessed using *t*-tests for continuous variables and chi-square tests for categorical variables. Depression was defined as a score of >16 on the second administration of the CESD.

In order to assess the association of specific sleep disturbances on the presence of depression, regression models were first built with the presence of insomnia and then the presence

of nightmares as independent variables. Each model controlled for age, abuse severity, and PTSD severity (with sleep items removed) as continuous variables and employment and race (white/minority) as dichotomous variables. Adjusted odds ratios (OR) were calculated with 95% confidence intervals (CI). Similar analyses were planned for suicidality as the dependent variable, but these were abandoned due to the low base rate of suicidality (only four participants endorsed suicidality at the 2-week mark).

Since the validated cutoff for depression on the CESD is based on the full scale score, the full CESD score was used in all analyses. For item-level missing data the sample mean for the item was used to impute values. All data were analyzed by using SAS version 9.2 (SAS Institute, Inc.) and all alphas were two-tailed and set at 0.05.

Results

In this sample of women with exposure to IPV, 46% had clinically significant insomnia based on the ISI cutoff of 10 and 32% met our definition of nightmare disturbance. Based on the ISI severity categories, 53% of the subjects reported some form of insomnia (24.1% mild, 19.0% moderate, and 9.9% severe). There were no differences between those with and without insomnia or with or without nightmares relative to age, race, or poverty (using U.S. Census Bureau levels), although participants with nightmares had a higher rate of unemployment. In terms of insomnia subtype, approximately 51% had moderate to severe sleep initiation insomnia, 57% had middle of the night insomnia, and only 30% had moderate to severe complaints of early morning awakening (totals do not sum to 100% because some individuals reported more than one subtype of severe insomnia).

Table 1 provides the results of bivariate analyses for participant characteristics (demographic, trauma, and sleep characteristics) and the presence or absence of depression. Compared with those without depression, participants who met criteria for depression were slightly older and had higher PTSD severity scores but did not differ with respect to employment, poverty status, or severity of violence they had experienced. They were also far more likely to have clinically significant insomnia and nightmare disturbance. Only four participants endorsed suicidality (3% of sample), and these data are not presented in Table 1; the results here are limited to the observation that all four of these subjects also had insomnia.

For the logistic regression models, assessments of multicollinearity included the largest condition index being 14.8 and the largest variance inflation factor being 1.25, indicating that multicollinearity was not an issue for the logistic regression models. Findings from the logistic regressions (Table 2) showed that the presence of insomnia was significantly associated with the presence of depression, controlling for demographic variables, abuse severity, and PTSD severity, with adjusted OR = 8.64 (CI: 2.96, 25.20). The presence of nightmare disturbance was also significantly associated with the presence of depression, controlling for demographic variables and abuse severity, with adjusted OR = 3.33 (CI: 1.00, 11.03).

Discussion

Insomnia and nightmares were highly prevalent in this court-based sample of women experiencing recent IPV. The

TABLE 2. ADJUSTED ASSOCIATIONS BETWEEN SLEEP DISTURBANCES AND DEPRESSION FROM LOGISTIC REGRESSION MODELS

	<i>Beta</i> (SE)	<i>aOR</i> (95% CI) ^a
Insomnia	2.16 (0.55)	8.64 (2.96–25.20)
Age	0.07 (0.03)	1.08 (1.02–1.14)
Race	0.29 (0.55)	1.34 (0.46–3.91)
Employment	–0.41 (0.55)	0.66 (0.22–1.95)
Abuse	0.01 (0.03)	1.01 (0.95–1.07)
PTSD	0.05 (0.02)	1.05 (1.02–1.08)
Nightmares	1.20 (0.61)	3.33 (1.00–11.03)
Age	0.07 (0.03)	1.07 (1.01–1.13)
Race	0.08 (0.49)	1.08 (0.41–2.84)
Employment	–0.18 (0.51)	0.83 (0.31–2.29)
Abuse severity	0.02 (0.03)	1.02 (0.97–1.07)
PTSD severity	0.05 (0.01)	1.05 (1.02–1.07)

^aAdjusted models control for age, race, employment, abuse severity, and PTSD severity with sleep items removed. aOR, adjusted odds ratio; CI, confidence interval.

presence of insomnia and nightmares each conferred significantly increased risk for the presence of depression in these women, when controlling for socio-demographic characteristics, victimization experiences, and PTSD symptoms. Overall, these findings suggest that among the indicated population of court-based IPV survivors, in which PTSD and depression were well-documented, sleep disturbances were strongly associated with mental health burden.

The finding that suicidal thoughts were endorsed by 3% of the sample (with all cases endorsing insomnia) preclude interpretation but merit an observation. On the one hand, this rate is lower than in other IPV research in which rates of suicidality were revealed at their original interview and were considerably higher (e.g., 15%).⁹ This may have been due to such studies assessing the presence of suicidality over the past year, whereas our question was in the past month, a time after which protective orders had been received. On the other hand, the possible association between presence of suicidal thoughts and presence of insomnia is consonant with observed relationships between sleep disturbances and suicide outcomes.²³

The full set of results are consistent with a growing body of literature suggesting that insomnia symptoms accompany psychiatric disorders and are associated with chronic illness, lower quality of life, increased probability of relapse and recurrence of depression, and increased suicide risk.³⁹ These issues are all well-known comorbid conditions reported by IPV survivors. Despite the type of violence victims report, they often report physical and mental health burdens^{40–42} that last long after the visible wounds have healed and safety is achieved.

Insomnia may be common following IPV for several reasons. For IPV victims who are in actively violent or dangerous situations, such as those seeking protection orders, the sleep environment may be especially associated with insomnia if the violence and danger surround the sleep experience and occur in the home, where violence is most likely to happen.¹ Hyperarousal and hypervigilance may become a conditioned response to the bedroom. Sleep may be perceived as dangerous if it restricts the ability to monitor one's surrounding, as reported by childhood sexual violence survivors.⁴³

Treatment of insomnia in the context of IPV may be complicated by the possibility that the insomnia may be adaptive (or viewed as adaptive) for some patients (i.e., for patients who continue to be in unsafe environments, or continue to feel unsafe at night or in the sleep environment). The former may need to be directly addressed (methods for optimizing personal safety) and the latter (the belief that one is unsafe) may require direct treatment prior to or as part of any form of insomnia therapy.

Thus, a tension exists between reducing insomnia symptoms and foregoing safety. Some IPV advocates may voice concerns that victim safety may be complicated further by treating sleep disturbances with medications or approaches that may blunt vigilance. As noted earlier, for some victims, their hyperarousal, a symptom of both PTSD and sleep disorders, may serve as a mechanism by which to protect their safety. Several approaches, both pharmacologic and behavioral, exist to address trauma-related sleep disturbances in a manner that provides relief for individuals in this population while keeping them safe. These include cognitive-behavioral therapies for insomnia,⁴⁴ for nightmares,⁴⁵ and their combination,⁴⁶ as well as the use of the nonsedating generic alpha-1 adrenoceptor antagonist prazosin for trauma-related nightmares.⁴⁷ It is important that insomnia be considered, assessed, and treated independent of the other mental health burdens of depression and PTSD because insomnia can persist following conventional treatments for depression and/or PTSD.^{48–50} Likewise, once safety is secured, victims may need assistance to “unlearn” sleep-related behaviors that lead to insomnia because the sleep disturbances may continue despite achieving safety. This is not to suggest that depression and PTSD be ignored or necessarily take less precedence in assessment or treatment planning, but rather that sleep disturbances be given equal consideration.

Limitations

In this essentially cross-sectional study, no causal or directional inferences can be made with respect to sleep disturbances and depression or suicidality. We were not able to assess the association of nightmares or insomnia on PTSD as a dependent variable since the MPSS was administered only once and this was approximately 2 weeks prior to administration of the ISI. It is also possible that court-based IPV victims seeking civil protection orders may represent a different group of women than those who may avail themselves of alternative venues for help such as shelters, hospitals, or informal means via friends and family. This study was limited to IPV victims of female gender although many IPV victims are male, who also have mental health consequences following abuse.^{51,52} While victims were asked about their mental health medications, the participants responded verbally that they were unfamiliar with their medication names and dosages. Accordingly, future research might be designed to consider medication effects. Finally, including women who declined to participate, this study had a response rate of 50% and a retention rate of 64%, limiting generalizability. These limitations are offset by the first use of the ISI, a validated sleep instrument, in this population and the unique family court venue for recruitment adding to the literature on women exposed to IPV.

Conclusions

The current study highlights the need to evaluate sleep disturbance among IPV victims and to refer them for targeted treatments that consider both their victimization and comorbid mental health symptoms. Given that sleep disturbances reduce individuals' abilities to function,⁵³ that women with IPV histories anecdotally identify poor sleep as a barrier to effective functioning, and that sleep disturbance is a potentially treatable risk factor for significant medical and psychiatric morbidity, it seems important to begin to treat these co-occurring issues with interventions designed for this population. Future work might include longitudinal intervention trials to effectively treat insomnia and/or nightmares while simultaneously addressing safety.

While speculative, it is possible that sleep interferes with a woman's ability to seek safety and navigate complex decision-making such as whether to remain in relationships or seek orders or other available care. Improved sleep may allow women to better cope with their situations, make informed decisions about safety planning, ameliorate depression and PTSD symptoms, and/or increase treatment-seeking for other mental health services. Whether sleep disturbance moderates future mental health morbidity in this group of women remains to be explored. What is known is that these burdens have evidence-based interventions, which now must be woven together to provide integrated treatment.

If a patient reports sleep disturbances in isolation of the IPV she is experiencing, and a provider prescribes a sleeping medication, the victim may put herself at risk for further harm by masking her hypervigilance, which viewed through an IPV lens is a necessity for safety. Viewed solely through a mental health lens, that same hypervigilance, leading to sleep disorders, is seen as a symptom of a mental health condition in need of treatment. Because sleep disturbance, PTSD, and depression may be inextricably woven together following IPV, providers need to assess for all three issues and consider alternative and/or adjuvant treatment approaches.

Acknowledgments

This study was supported by National Institutes of Health grants: K01MH075965-01, T32MH18911, and K23NR010408. The authors also wish to acknowledge the contributions they enjoy and benefit from their collaborations with the Monroe County Family Court and Alternatives for Battered Women, Inc., which are both in Rochester, New York.

Disclosure Statement

The following disclosures of potential conflicts of interest and/or financial interests are made by WRP: participation in pharmaceutical multi-site clinical trials (Merck), consulting fees (Pennside Partners), authorship fee (Sanofi-Aventis), royalties (Sleep Manual, Barron's Educational Press) and by MLP: industry supported research (Sanofi-Aventis, Cephalon), participation in pharmaceutical multi-site clinical trials (Sanofi, Aventis, Sanofi-Aventis, Vanda), consulting fees (Gerson Lehman Group, Clinical Advisors, MedaCopr/Leerink Swann, L.E.K. Consulting, Sleep Easily, Actelion, Takeda), speaker honoraria (Sanofi-Aventis, Sleep Medicine Education Institute), authorship fee (Sanofi-Aventis), directorship and salary (Internet Didactic Services), free use of

equipment (sstnet.com, Minimitter/Respironics, Lifelines, Inc.), and industry sponsorship of continuing medical education course (Sanofi-Aventis, Respironics, Sepracor, Cephalon, Merck, Neurocare, Phillips). All remaining authors report no financial interests, relationships, or affiliations relevant to the subject matter or materials discussed in this article.

References

- Tjaden P, Thoennes N. Prevalence and incidence of violence against women: findings from the National Violence Against Women Survey. *The Criminologist* 1999;24:1–14.
- Dutton MA. Pathways linking intimate partner violence and posttraumatic disorder. *Trauma Violence Abuse* 2009;10:211–224.
- Ludermir AB, Schraiber LB, D'Oliveira AFPL, Franca-Junior I, Jansen HA. Violence against women by their intimate partner and common mental disorders. *Soc Sci Med* 2008;66:1008–1018.
- Saewyc EM, Brown D, Plane M, Mundt MP, Zakletskaia L, Wiegel J, Fleming MF. Gender differences in violence exposure among university students attending campus health clinics in the United States and Canada. *J Adolesc Health* 2009;45:587–594.
- Thompson RS, Bonomi AE, Anderson M, Reid RJ, Dimer JA, Carrell D, Rivara FP. Intimate partner violence—prevalence, types, and chronicity in adult women. *Am J Prevent Med* 2006;30:447–457.
- Butterworth P. Lone mothers' experience of physical and sexual violence: association with psychiatric disorders. *Brit J Psychiatry* 2004;184:21–27.
- Golding JM. Intimate partner violence as a risk factor for mental disorders: a meta-analysis. *J Fam Violence* 1999;14:99–132.
- Cerulli C, Edwardsen EA, Duda J, Conner KR, Caine E. Protection order petitioners' health care utilization. *Violence Against Women* 2010;16:679–690.
- Hurwitz EJH, Gupta J, Liu R, Silverman JG, Raj A. Intimate partner violence associated with poor health outcomes in U.S. South Asian women. *J Immigr Minor Health* 2006;8:251–261.
- Cerulli C, Gellman RA, Nichols C, Hall D, Conner KR, Caine ED. Mental and physical health symptoms of family court intimate partner violence petitioners. *International J Law and Psychiatry* 2011;34:94–98.
- Kaslow N, Thompson M, Meadows L, Jacobs D, Chance S, Gibb B, Bornstein H, Hollins L, Rashid A, Phillips K. Factors that mediate and moderate the link between partner abuse and suicidal behavior in African-American women. *J Consult Clin Psychol* 1998;66:533–540.
- Kilpatrick DG, Best CL, Veronen LJ, Amick AE, Villepontoux LA, Ruff GA. Mental health correlates of criminal victimization: a random community survey. *J Consult Clin Psychol* 1985;53:866–873.
- Carmen EH, Rieker PP, Mills T. Victims of violence and psychiatric illness. *Am J Psychiatry* 1984;141:378–383.
- Pigeon WR. Insomnia as a risk factor for disease. In: Buysee DJ, Sateia MJ, eds. *Insomnia: Diagnosis and Treatment*. New York: Informa Healthcare, 2010.
- Tsuno N, Besset A, Ritchie K. Sleep and depression. *J Clin Psychiatry* 2005;66:1254–1269.
- Pigeon WR, Perlis ML. Insomnia and depression: birds of a feather? *Int J Sleep Disord* 2007;1:82–91.
- Ross RJ, Ball WA, Sullivan KA, Caroff SN. Sleep disturbances as the hallmark of posttraumatic stress disorder. *Am J Psychiatry* 1989;146:697–707.
- Mellman TA, Pigeon WR. Dreams and nightmares in post-traumatic stress disorder. In: Kryger M, Roth T, Dement WC, eds. *Principles and Practice of Sleep Medicine*. 4th ed. Philadelphia: Elsevier Saunders, 2005:573–578.
- Green BL. Disasters and posttraumatic stress disorder. In: Davidson JR, Foa EB, eds. *Posttraumatic Stress Disorder: DSM-IV and Beyond*. Washington DC: American Psychiatric Press, 1993.
- Ohayon MM, Shapiro CM. Sleep disturbances and psychiatric disorders associated with posttraumatic stress disorder in the general population. *Compr Psychiatry* 2000;41:469–478.
- Clum GA, Nishith P, Resick PA. Trauma-related sleep disturbance and self-reported physical health symptoms in treatment-seeking female rape victims. *J Nerv Ment Dis* 2001;189:618–622.
- Mellman TA, Pigeon WR, Nowell PD, Nolan B. Relationships between REM sleep findings and PTSD symptoms during the early aftermath of trauma. *J Trauma Stress* 2007;20:893–901.
- Pigeon WR, Caine ED. Insomnia and the risk for suicide: does sleep medicine have interventions that can make a difference? *Sleep Med* 2010;11:816–817.
- Lowe P, Humphreys C, Williams SJ. Night terrors—women's experiences of (not) sleeping where there is domestic violence. *Violence Against Women*. 2007;13:549–561.
- Taft A, Broom DH, Legge D. General practitioner management of intimate partner abuse and the whole family: qualitative study. *Br Med J* 2004;328:618–621.
- Brokaw J, Fullerton-Gleason L, Olson L, Crandall C, McLaughlin S, Sklar D. Health status and intimate partner violence: a cross-sectional study. *Ann Emerg Med* 2002;39:31–38.
- Rasmussen B. An exploratory survey of nightmares, dreams, and sleep patterns in women dealing with relationship violence. *Violence Against Women* 2007;13:314–322.
- Hathaway JE, Mucci LA, Silverman JG, Brooks DR, Mathews R, Pavlos CA. Health status and health care use of Massachusetts women reporting partner abuse. *Am J Prevent Med* 2000;19:302–307.
- Humphreys J, Lee K. Sleep disturbance in battered women living in transitional housing. *Issues Ment Health Nurs* 2005;26:771–780.
- Bastien C, Vallieres, Morin CM. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Med* 2001;2:297–307.
- Morin CM. *Insomnia: Psychological Assessment and Management*. New York: Guilford Press, 1993.
- Sormanti M, Pereira L, El Bassel N, Witte S, Gilbert L. The role of community consultants in designing an HIV prevention intervention. *AIDS Educ Prevent* 2001;13:311–328.
- Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health* 1998;19:173–202.
- Falsetti SA, Resnick HS, Resick PA, Kilpatrick DG. The Modified PTSD Symptom Scale: a brief self-report measure of posttraumatic stress disorder. *The Behavior Therapist* 1993;16:161–162.
- Weathers FW, Ruscio AM, Keane TM. Psychometric properties of nine scoring rules for the clinician-administered posttraumatic stress disorder scale. *Psychol Assess* 1999;11:124–133.

36. Vega EM, O'Leary KD. Test-retest reliability of the revised conflict tactics scales (CTS2). *J Fam Violence* 2007;22:703-708.
37. Straus MA, Hamby SL, Boney-McCoy S, Sugarman DB. The revised Conflict Tactics Scales (CTS2)—development and preliminary psychometric data. *J Fam Issues* 1996;17:283-316.
38. Radloff LS. The CES-D scale: a self-report depressive scale for research in the general population. *J Appl Psychol Measur* 1977;1:385-401.
39. Menza M, Marin H, Oppen RS. Residual symptoms in depression: can treatment be symptom-specific? *J Clin Psychiatry* 2003;64:516-523.
40. Campbell J, Jones AS, Dienemann J, Kub J, Schollenberger J, O'Campo P, Gielen AC, Wynne C. Intimate partner violence and physical health consequences. *Arch Intern Med* 2002;162:1157-1163.
41. Coker AL, Smith PH, Bethea L, King MR, McKeown RE. Physical health consequences of physical and psychological intimate partner violence. *Arch Fam Med* 2000;9:451-457.
42. Zlotnick C, Johnson DM, Kohn R. Intimate partner violence and long-term psychosocial functioning in a national sample of American women. *J Interpers Violence* 2006;21:262-275.
43. Craske MG, Tsao JCI. Assessment and treatment of nocturnal panic attacks. *Sleep Med Rev* 2005;9:173-184.
44. Deviva JC, Zayfert C, Pigeon WR, Mellman TA. Treatment of residual insomnia after CBT for PTSD: case studies. *J Traum Stress*. 2005;18:155-159.
45. Lancee J, Spoormaker VI, Krakow B, van den Bout J. A systematic review of cognitive-behavioral treatment for nightmares: toward a well-established treatment. *J Clin Sleep Med* 2008;4:475-480.
46. Germain A, Shear MK, Hall M, Buysse DJ. Effects of a brief behavioral treatment for PTSD-related sleep disturbances: a pilot study. *Behav Res Ther* 2007;45:627-632.
47. Taylor F, Mellman TA, Gross C, Peskind ER, Raskind MA. Prazosin effects on objective sleep measures and clinical symptoms in civilian trauma PTSD: a placebo controlled study. *Biol Psychiatry* 2008;63:629-632.
48. Carney CE, Segal ZV, Edinger JD, Krystal AD. A comparison of rates of residual insomnia symptoms following pharmacotherapy or cognitive-behavioral therapy for major depressive disorder. *J Clin Psychiatry* 2007;68:254-260.
49. Manber R, Rush J, Thase ME, Arnow B, Klein D, Trivedi MH, Korenstein SG, Markowitz JC, Dunner DL, Munsaka M, Borian FE, Keller MB. The effects of psychotherapy, Nefazodone, and their combination on subjective assessment of disturbed sleep in chronic depression. *Sleep*. 2003;26:130-136.
50. Zayfert C, Deviva JC. Residual insomnia following cognitive behavioral therapy for PTSD. *J Trauma Stress* 2004;17:69-73.
51. Rhodes KV, Houry D, Cerulli C, Straus H, Kaslow NJ, McNutt LA. Intimate partner violence and comorbid mental health conditions among urban male patients. *Ann Fam Med* 2009;7:47-55.
52. Straus H, Cerulli C, McNutt LA, Rhodes KV, Conner KR, Kemball RS, Kaslow NJ, Houry D. Intimate partner violence and functional health status: associations with severity, danger, and self-advocacy behaviors. *J Womens Health* 2009;18:625-631.
53. Leger D, Guilleminault C, Bader G, Levy E, Paillard M. Medical and socio-professional impact of insomnia. *Sleep* 2002;25:625-629.

Address correspondence to:

Wilfred R. Pigeon, Ph.D.

University of Rochester Medical Center

Sleep & Neurophysiology Research Laboratory

300 Crittenden Boulevard-Box PSYCH

Rochester, NY 14642-8409

E-mail: wilfred_pigeon@urmc.rochester.edu