## Title

Lifetime history of interpersonal partner violence is associated with insomnia among midlife women veterans.

## Permalink

## Journal

## Authors

Inslicht, Sabra

Byers, Amy

Gibson, Carolyn

et al.

## Publication Date

## DOI

Peer reviewed

# Lifetime History of Interpersonal Partner Violence is Associated with Insomnia among Midlife Women Veterans

**Lizabeth A. Goldstein, PhD**[1,2], **Karen P. Jakubowski, PhD**[3], **Alison J. Huang, MD, MAS**[2], **Karen Seal, MD, MPH**[1,2], **Shira Maguen, PhD**[1,2], **Sabra S. Inslicht, PhD**[1,2], **Amy L. Byers, PhD, MPH**[1,2], **Carolyn J. Gibson, PhD, MPH**[1,2]

[1]San Francisco Veterans Affairs Health Care System, 4150 Clement St., San Francisco, CA 94121, USA

[2]University of California, San Francisco, 513 Parnassus Ave., San Francisco, CA 94143, USA

[3]University of Pittsburgh, 3811 O'Hara St., Pittsburgh, PA 15213, USA

## Abstract

**Objective:** Over a third of women in the United States report a lifetime history of intimate partner violence. Although a recent review found that intimate partner violence is related to poor subjective sleep, the majority of studies involved reproductive-aged women and used suboptimal measures of interpersonal violence and/or insomnia. We examined the relationship between lifetime intimate partner violence and current clinical insomnia in a cross-sectional sample of midlife women veterans.

**Methods:** Cross-sectional data were drawn from the Midlife Women Veterans Health Survey. Women Veterans ($N = 232$) aged 45–64 enrolled in Department of Veterans Affairs health care in Northern California completed an adapted version of the Extended-Hurt, Insult, Threaten, Scream to assess lifetime history of intimate partner violence (screening threshold score and any physical, sexual, and psychological intimate partner violence) and the Insomnia Severity Index to assess current insomnia.

**Results:** In multivariable analyses, lifetime history of intimate partner violence was associated with two- to four-fold odds of current clinical insomnia, including overall intimate partner violence (odds ratio 3.24, 95% confidence interval 1.57–6.69), physical intimate partner violence (odds ratio 2.01, 95% confidence interval 1.09–3.70), psychological intimate partner violence (odds ratio 3.98, 95% confidence interval 2.06–7.71), and sexual intimate partner violence (odds ratio 2.09, 95% confidence interval 1.08–4.07).

**Conclusions:** Lifetime history of intimate partner violence is common and may be associated with clinical insomnia during midlife. Findings highlight the importance of screening midlife women for intimate partner violence and recognizing the potential role of this traumatic exposure on women's health.

## Keywords

insomnia; intimate partner violence; midlife women; veterans

---

Over a third of women in the United States report a history of intimate partner violence (IPV), making this one of the most common forms of trauma experienced by women.[1] IPV includes a variety of exposures, including physical violence, sexual assault, and/or psychological abuse by a current or former partner. Women who experience IPV are at risk for developing a number of mental health conditions, including posttraumatic stress disorder (PTSD)[2] and depression,[3] as well as aging-related physical health conditions including diabetes,[4] hypertension,[5] and urinary tract dysfunction.[6, 7] Sleep difficulty, such as insomnia, is transdiagnostic, either included as a diagnostic criterion of the disorder itself (e.g., PTSD, depression) or as a correlate of the physical symptoms of the disorder (e.g., nocturia). Insomnia is also associated with reduced health-related quality of life[8] and numerous physical health problems, such as heart disease, high blood pressure, and chronic pain.[9] People with insomnia utilize healthcare at an increased rate, including emergency room visits and medication use.[10] In addition, insomnia is related to poor mental health outcomes, including suicidal ideation, attempt, and completion.[11]

Sleep difficulty is common among women across the lifespan, and increases with menopause and aging.[12, 13] Clinical insomnia, one of the most common forms of sleep difficulty, is present in an estimated 40–60% of women in midlife and has negative impact on occupational, social, and daily functioning.[14] Sleep difficulty during this period is frequently attributed to disruptive nocturnal menopause symptoms (e.g. night sweats, nocturia).[13–16] However, not all women report these symptoms, and while they may cause sleep disruption, they are not likely to contribute to common sleep difficulties such as sleep onset insomnia.[17] Further research is needed to identify factors contributing to sleep disturbance among women in midlife.

Of the few studies that have examined IPV and sleep conditions, most have been limited on sleep measures and information on women in midlife.[18] Although sleep disturbance is more common among women in midlife[19] a recent review highlighted that studies are mainly focused on reproductive-aged women.[18] This review concluded that IPV is related to poor subjective sleep, but only half of the included studies used validated sleep measures. (e.g., use of single dichotomous sleep disturbance). Moreover, additional research into IPV-based risk for insomnia among midlife women, using multidimensional scales of IPV that capture multiple types of violence as well as frequency of exposure, may improve approaches to screening and treatment in midlife women.

In the current study, we examined the relationship between lifetime history of physical, sexual, and emotional IPV and insomnia in a sample of midlife women veterans using validated measures and adjusted for sociodemographic and clinical characteristics. Given

results of past studies examining the effects of lifetime IPV on other health factors, we focus on lifetime IPV in this study.[20, 21] Evaluating the relationship between IPV and sleep is particularly important in a veteran population, as women veterans are more likely than women non-veterans to report lifetime IPV.[20] In addition, this work is timely, as the US Veterans Health Administration is about to implement national IPV screening.[20, 22] We hypothesized that all forms of IPV would be associated with increased likelihood for current clinical insomnia in this at-risk population.

## Methods

### Sample

Data were drawn from a cross-sectional, observational study of midlife women veterans' health conducted from March 2019-May 2020. Procedures have been previously described.[23] Briefly, eligible participants were cisgender women veterans, 45–64 years old at the time of recruitment, with at least one clinical encounter in one of three VA Health Care Systems in Northern California in the previous two years, and no current diagnoses of dementia or active psychosis. Potential participants were mailed information packets about study participation, as well as an "opt-out" postcard. Telephone follow-up was conducted two weeks after mailing for those who did not return either signed consent forms or opt-out postcards during that period. Once enrolled, participants were mailed survey questionnaire packets or emailed a link to complete the same packet online. All participants provided written informed consent and the study was approved by the IRB of the University of California, San Francisco and the San Francisco VA Health Care System Research and Development Committee.

### Measures

**Intimate Partner Violence**—Participants completed an adapted version of the Extended-Hurt, Insult, Threaten, Scream (E-HITS) to assess intimate partner violence exposure.[24] The E-HITS has demonstrated reliability and validity in assessing past-year IPV in health care settings;[25] the adapted version in used in this study also assessed lifetime exposure. Participants were asked, "How often did a partner (1) physically hurt you?, (2) insult you or talk down to you?, (3) threaten you with harm?, (4) scream or curse at you?, and (5) force you to have sexual activities?" in their lifetime. Responses were scored on a 5-point scale (1=never to 5=frequently). Total scores were calculated from the sum of item ratings (range 5–25), with a score of 7 defined as IPV exposure. Physical IPV was categorized as a response above 1 ("never") for item 1, and sexual IPV was categorized as a response above 1 ("never") for item 5.[26] Psychological IPV was categorized as a response above 2 ("rarely") to items 2, 3, and/or 4.[27]

**Insomnia**—Participants completed the Insomnia Severity Index (ISI) to assess current clinical insomnia. The ISI has been validated as a measure of insomnia symptom severity, demonstrating reliability and validity among adults with primary and secondary insomnia.[28] Three items assess severity of insomnia based on timing of insomnia (falling asleep, staying asleep, and early morning awakening). Four items assess distress and disruption to functioning based on insomnia symptoms. Each item is scored from 0 to 4, with higher

scores indicating greater sleep difficulty. Insomnia scores were examined as a dichotomous variable, with moderate-severe clinical insomnia defined as a score of   15.

**Covariates**—Participants self-reported their age, race, ethnicity, and educational attainment with structured items in the study survey. Due to small cell sizes, race was collapsed into White vs. non-White, and ethnicity was collapsed into Hispanic vs. non-Hispanic for analyses. Education was collapsed into less than college degree, college degree, and some or completion of graduate school. Body mass index (BMI) was calculated from self-reported height and weight (weight in kilograms divided by height in meters squared). Menopause status was defined by self-reported menstrual bleeding patterns. Women were categorized as postmenopausal if they had no menstrual cycle in the previous 12 months, whether owing to natural cessation or hysterectomy and/or oophorectomy. Depressive symptoms were measured using the Patient Health Questionaire-9 (PHQ-9), with clinically significant symptoms defined as a score of 10 or above.[29] PTSD symptoms were assessed using the Posttraumatic Stress Disorder Checklist (PCL-5). A cut off of 33 or above was used to indicate symptom burden and PTSD in the past month.[30] PHQ-9 and PCL-5 thresholds were chosen based on previously established research.[29, 30]

## Statistical Analyses

Descriptive statistics, including frequencies and percentages for categorical data and mean values and SDs) for continuous data, were used to summarize key variables and covariates. In separate multivariable logistic regression analyses, psychological IPV, physical IPV, sexual IPV, and overall IPV score were modeled as factors associated with the outcome of moderate-severe clinical insomnia. All models were adjusted for demographic characteristics (age, race/ethnicity, education), menopause status, and BMI. Older age, membership in minoritized populations, lower education (or other measures of socioeconomic status), perimenopause, and higher BMI have been previously associated with sleep difficulty.[13, 31] Covariates were chosen a priori given these known associations. In sensitivity analyses, associations between IPV and clinical insomnia were assessed in three additional sets of models in which (1) probable PTSD, (2) clinically significant depressive symptoms, and (3) both probable PTSD and clinically significant depressive symptoms were included as additional covariates. All analyses were conducted using SPSS (IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp). Reported $p$ values are 2-sided, and $p < .05$ was considered statistically significant.

## Results

### Participants

A total of 232 midlife women completed surveys. Average age was 55.95 (SD = 5.13, range = 45–64 by design). Most participants were white (74%), with 10% of the sample identifying as Black or African American and 10% identifying as Hispanic or Latina. Approximately half of the sample completed at least a college degree (49%). Most participants were postmenopausal (82%) and average BMI was 29.71 (SD = 7.03). Additional sample descriptive statistics are presented in Table 1.

### Exposure to IPV

Approximately two-thirds of participants ($n$ = 147, 63%) met criteria for lifetime IPV as per the E-HITS. In response to individual items, 35% reported a history of any physical IPV, 27% reported a history of any sexual IPV, and 52% reported a history of any psychological IPV.

### Association between IPV and insomnia

Moderate-severe clinical insomnia was reported by 36% of participants. Mean ISI was 11.82 ($SD$ = 7.01). Table 2 presents odds ratios (ORs) and 95% confidence intervals (CIs) for all models. In multivariable analyses, lifetime history of IPV was associated with two- to four-fold odds of current clinical insomnia, including overall IPV (OR 3.24, 95% CI 1.57–6.69), physical IPV (OR 2.01, 95% CI 1.09–3.70), psychological intimate partner violence (OR 3.98, 95% CI 2.06–7.71), and sexual IPV (OR 2.09, 95% CI 1.08–4.07). After further adjustment for clinically significant depressive symptoms and probable PTSD, results were attenuated but remained significant for both overall IPV and psychological IPV but were no longer statistically significant for physical and sexual IPV (Table 2).

## Discussion

In this study of midlife women veterans, exposure to IPV was associated with moderate-severe insomnia symptoms. Results were particularly strong in the case of psychological IPV, a form of IPV that has not been well-studied among midlife women or in relation to adverse health outcomes. Thus, this study begins to address a gap in the literature regarding type of IPV and relationships with sleep disturbance.[18]

Results from the present study differ slightly from one prior study of IPV and sleep among women veterans.[32] Dichter et al. found that sexual IPV, but not physical or psychological IPV, was associated with sleep difficulty,[7] while our results suggest that physical, sexual, and psychological IPV were all associated with clinical insomnia, though only psychological IPV remained associated after accounting for symptoms of depression and PTSD. These results warrant future study in prospective designs that study the development of depressive and PTSD symptoms with insomnia symptoms longitudinally over time, given evidence of bidirectional associations between mood and insomnia symptoms.[33, 34] Differences in results from the present study compared to those of Dichter and colleagues also may be reflective of the current study using validated measure of insomnia (versus a single item of sleep difficulty) and/or the current study's sample limited to women in midlife with an overall older mean age (mean age 56, range 45–64 vs. 47, range 22–64). Additional research is needed to elucidate what aspects of psychological IPV may be so impactful on insomnia. While the items regarding psychological IPV may seem like common experiences, such as screaming/cursing, the E-HITS considers frequency of these experiences in its cutoff for exposure to psychological IPV. Moreover, the E-HITS assessment of psychological IPV additionally includes an item on being threatened with harm, a severe behavior that is related to poor outcomes, including intimate partner homicide.[35] Our results underscore the importance of assessing for specific types of IPV given these variable findings.

Over 60% of midlife women in this sample reported lifetime history of IPV. Reported rates of IPV vary dramatically depending on study methodology and sample, and are known to be higher among women veterans than civilians.[20] One study found that women veterans were twice as likely to report lifetime physical and/or sexual IPV than their non-veteran peers.[20] Similar to the high rates seen in the current study, over 80% of women veterans aged 22–64 reported physical, sexual, and/or psychological IPV in a similar examination of VA users in one urban health care system.[32] IPV is typically studied in reproductive-aged women, and less is known about the prevalence and correlates of IPV in midlife, thus, more work is needed among aging women.[36] Recent examinations of the E-HITS used in routine IPV screening in VA health care settings have shown that IPV remains prevalent among midlife women veterans.[37] Our findings reveal potential limitations of the US Preventive Services Task Force recommendations focusing only on women of reproductive age, as IPV can occur throughout the lifespan and may affect important health outcomes beyond reproductive years.[32, 37] Screening midlife women for IPV allows providers to acknowledge the role of traumatic exposure on health and address a clinical symptom that impairs functioning, reduces quality of life, and is associated with significant risks to mental and physical health.

Insomnia was also common in this sample, with just over a third of participants reporting symptoms consistent with moderate-to-severe insomnia, and another third reporting symptoms in the "subthreshold" insomnia range. Our results are consistent with prior work in women veterans, which indicated that over half (58%) of midlife women reported clinically-relevant insomnia symptoms via a survey based on the International Classification of Sleep Disorders, 2nd Edition criteria.[38] Critically, their results also suggested that midlife women were more likely to report insomnia symptoms relative to other age groups.[38] Sleep disturbance is a cardinal menopause symptom, and the present study suggests that the association between IPV exposure and insomnia persists in both peri- and postmenopause. Jones et al. noted that sleep disturbance occurs in midlife earlier than previously thought and suggested screening women over 40 years old for sleep disturbance as well as risk factors.[39] Our findings also suggest that providers should consider evaluating for sleep disturbance regularly in midlife women, not just in the context of menopause symptoms. Additionally, providers can evaluate specifically for insomnia, rather than the more general "sleep disturbance," to better direct treatment planning. Initial research has demonstrated the effectiveness of nonpharmacological treatment options for insomnia in midlife women, most notably Cognitive Behavioral Therapy for Insomnia.[40, 41]

There are some limitations of this study. First, given the cross-sectional nature of this study, conclusions cannot be drawn regarding causality. Second, the study involved a relatively small sample of midlife female Veterans in Northern California, thus, results may not be generalizable to all women with trauma histories, including younger women and civilian populations. While this study adds to the extant body of research by utilizing a validated measure of insomnia symptoms, the ISI captures current insomnia only, whereas symptoms of insomnia can vacillate over time in response to a number of factors. Thus a cross-sectional approach may not accurately represent lifetime insomnia or future/past episodes of insomnia. Further, the ISI yields a measure of self-reported insomnia; it will be important for future studies to include interviewer-assessed structured clinical diagnosis of insomnia disorder. Additionally, the E-HITS is validated for past year IPV measurement

but was adapted to a lifetime time frame for this study. Growing evidence suggests there are long-term adverse health sequelae of IPV exposure, supporting a focus on lifetime IPV in this study.[42] However, prevalence of lifetime exposure to IPV is notably higher than past-year IPV prevalence[1], and future studies can additionally examine the relationship between current IPV and insomnia to better understand these relationships. In addition, while we focused on IPV in this study, other types of trauma may contribute to insomnia and should be examined in future studies. Finally, temporality of exposure to IPV and insomnia was not evaluated in this study.

However, this study has a number of strengths. This study utilized validated measures for both IPV and insomnia, rather than single, dichotomous items. Our outcome reflects a widely-used and validated cutoff of moderate-severe clinical insomnia symptoms. In addition, we focused on clinical insomnia rather than the heterogenous concept of "sleep difficulty," allowing for identification of a discrete disorder with targeted treatments available. Finally, this study of women veterans may serve as a benchmark for future research evaluating IPV and insomnia in other groups of women in midlife, a relatively understudied age group with high rates of sleep challenges.

## Conclusions

Lifetime history of IPV is a common exposure among midlife women veterans that may contribute to clinical insomnia during this stage of life. Psychological IPV appears particularly detrimental to sleep in this population. Findings highlight the importance of screening midlife women for intimate partner violence and recognizing the potential role of this traumatic exposure on women's health.

## Sources of funding:

## References

1. Smith SG, Zhang X, Basile KC, et al. The National Intimate Partner and Sexual Violence Survey (NISVS): 2015 Data Brief–Updated Release. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention; 2018.

2. Kilpatrick DG, Resnick HS, Milanak ME, Miller MW, Keyes KM, Friedman MJ. National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV and DSM-5 criteria. J Trauma Stress. 2013;26(5):537–47. 10.1002/jts.21848 [PubMed: 24151000]

3. Golding JM. Intimate partner violence as a risk factor for mental disorders: A meta-analysis. Journal of family violence. 1999;14(2):99–132.

4. Mason SM, Wright RJ, Hibert EN, et al. Intimate partner violence and incidence of type 2 diabetes in women. Diabetes Care. 2013;36(5):1159–65. 10.2337/dc12-1082 [PubMed: 23248189]

5. Mason SM, Wright RJ, Hibert EN, Spiegelman D, Forman JP, Rich-Edwards JW. Intimate partner violence and incidence of hypertension in women. Annals of epidemiology. 2012;22(8):562–7. 10.1016/j.annepidem.2012.05.003 [PubMed: 22717307]

6. Raphael E, Van Den Eeden SK, Gibson CJ, et al. Interpersonal violence and painful bladder symptoms in community-dwelling midlife to older women. Am J Obstet Gynecol. 2021. 10.1016/j.ajog.2021.09.017

7. Boyd BAJ, Gibson CJ, Van Den Eeden SK, et al. Interpersonal Trauma as a Marker of Risk for Urinary Tract Dysfunction in Midlife and Older Women. Obstet Gynecol. 2020;135(1):106–12. 10.1097/AOG.0000000000003586 [PubMed: 31809425]

8. LeBlanc M, Beaulieu-Bonneau S, Merette C, Savard J, Ivers H, Morin CM. Psychological and health-related quality of life factors associated with insomnia in a population-based sample. J Psychosom Res. 2007;63(2):157–66. 10.1016/j.jpsychores.2007.03.004 [PubMed: 17662752]

9. Taylor DJ, Mallory LJ, Lichstein KL, Durrence HH, Riedel BW, Bush AJ. Comorbidity of chronic insomnia with medical problems. Sleep. 2007;30(2):213–8. 10.1093/sleep/30.2.213 [PubMed: 17326547]

10. Hatoum HT, Kong SX, Kania CM, Wong JM, Mendelson WB. Insomnia, health-related quality of life and healthcare resource consumption. A study of managed-care organisation enrollees. Pharmacoeconomics. 1998;14(6):629–37. 10.2165/00019053-199814060-00004 [PubMed: 10346415]

11. Pigeon WR, Pinquart M, Conner K. Meta-analysis of sleep disturbance and suicidal thoughts and behaviors. The Journal of clinical psychiatry. 2012;73(9):e1160–7. 10.4088/JCP.11r07586 [PubMed: 23059158]

12. Eichling PS, Sahni J. Menopause related sleep disorders. J Clin Sleep Med. 2005;1(3):291–300. [PubMed: 17566192]

13. Shaver JL, Woods NF. Sleep and menopause: a narrative review. Menopause. 2015;22(8):899–915. 10.1097/GME.0000000000000499 [PubMed: 26154276]

14. Hall MH, Kline CE, Nowakowski S. Insomnia and sleep apnea in midlife women: prevalence and consequences to health and functioning. F1000Prime Rep. 2015;7:63. 10.12703/P7-63 [PubMed: 26097736]

15. Galvan T, Camuso J, Sullivan K, et al. Association of estradiol with sleep apnea in depressed perimenopausal and postmenopausal women: a preliminary study. Menopause. 2017;24(1):112–7. 10.1097/GME.0000000000000737 [PubMed: 27648659]

16. Baker FC, de Zambotti M, Colrain IM, Bei B. Sleep problems during the menopausal transition: prevalence, impact, and management challenges. Nat Sci Sleep. 2018;10:73–95. 10.2147/NSS.S125807 [PubMed: 29445307]

17. Joffe H, Massler A, Sharkey KM. Evaluation and management of sleep disturbance during the menopause transition. Semin Reprod Med. 2010;28(5):404–21. 10.1055/s-0030-1262900 [PubMed: 20845239]

18. Gallegos AM, Trabold N, Cerulli C, Pigeon WR. Sleep and Interpersonal Violence: A Systematic Review. Trauma Violence Abuse. 2021;22(2):359–69. 10.1177/1524838019852633 [PubMed: 31131736]

19. Kravitz HM, Ganz PA, Bromberger J, Powell LH, Sutton-Tyrrell K, Meyer PM. Sleep difficulty in women at midlife: a community survey of sleep and the menopausal transition. Menopause. 2003;10(1):19–28. 10.1097/00042192-200310010-00005 [PubMed: 12544673]

20. Dichter ME, Cerulli C, Bossarte RM. Intimate partner violence victimization among women veterans and associated heart health risks. Womens Health Issues. 2011;21(4 Suppl):S190–4. 10.1016/j.whi.2011.04.008 [PubMed: 21724140]

21. Dichter ME, Marcus SC, Wanger C, Bonomi AE Associations Between Psychological, Physical, and Sexual Intimate Partner Violence and Health Outcomes Among Women Veteran VA Patients. Social Work in Mental Health. 2014;12(5–6):411–28.

22. Iverson KM, Vogt D, Dichter ME, et al. Intimate Partner Violence and Current Mental Health Needs Among Female Veterans. J Am Board Fam Med. 2015;28(6):772–6. 10.3122/jabfm.2015.06.150154 [PubMed: 26546653]

23. Hargrave AS, Maguen S, Inslicht SS, et al. Veterans Health Administration Screening for Military Sexual Trauma May Miss Over Half of Cases Among Midlife Women Veterans. Womens Health Issues. 2022. 10.1016/j.whi.2022.06.002

24. Iverson KM, King MW, Resick PA, Gerber MR, Kimerling R, Vogt D. Clinical utility of an intimate partner violence screening tool for female VHA patients. J Gen Intern Med. 2013;28(10):1288–93. 10.1007/s11606-013-2534-x [PubMed: 23824907]

25. Chan C CY, Au A, Cheung G. Reliability and Validity of the "Extended - Hurt, Insult, Threaten, Scream" (E-HITS) Screening Tool in Detecting Intimate Partner Violence in Hospital Emergency Departments in Hong Kong. Hong Kong Journal of Emergency Medicine. 2010;17(2):109–17. doi:10.1177/102490791001700202

26. Iverson KM, King MW, Gerber MR, et al. Accuracy of an intimate partner violence screening tool for female VHA patients: a replication and extension. J Trauma Stress. 2015;28(1):79–82. 10.1002/jts.21985 [PubMed: 25624170]

27. Dichter ME, Sorrentino A, Bellamy S, Medvedeva E, Roberts CB, Iverson KM. Disproportionate Mental Health Burden Associated With Past-Year Intimate Partner Violence Among Women Receiving Care in the Veterans Health Administration. J Trauma Stress. 2017;30(6):555–63. 10.1002/jts.22241 [PubMed: 29193289]

28. Bastien CH, Vallières A, Morin CM. Validation of the Insomnia Severity Index as an outcome measure for insomnia research. Sleep Med. 2001;2(4):297–307. 10.1016/s1389-9457(00)00065-4 [PubMed: 11438246]

29. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16(9):606–13. [PubMed: 11556941]

30. Bovin MJ, Marx BP, Weathers FW, et al. Psychometric properties of the PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (PCL-5) in veterans. Psychol Assess. 2016;28(11):1379–91. 10.1037/pas0000254 [PubMed: 26653052]

31. Thurston RC, Bromberger JT, Joffe H, et al. Beyond frequency: who is most bothered by vasomotor symptoms? Menopause. 2008;15(5):841–7. 10.1097/gme.0b013e318168f09b [PubMed: 18521049]

32. Dichter ME, Marcus SC, Wagner C, Bonomi AE. Associations Between Psychological, Physical, and Sexual Intimate Partner Violence and Health Outcomes Among Women Veteran VA Patients. Social Work in Mental Health. 2014;12(5–6):411–28. 10.1080/15332985.2013.870104

33. Sivertsen B, Salo P, Mykletun A, et al. The bidirectional association between depression and insomnia: the HUNT study. Psychosom Med. 2012;74(7):758–65. 10.1097/PSY.0b013e3182648619 [PubMed: 22879427]

34. Chinoy ED, Carey FR, Kolaja CA, Jacobson IG, Cooper AD, Markwald RR. The bidirectional relationship between post-traumatic stress disorder and obstructive sleep apnea and/or insomnia in a large U.S. military cohort. Sleep Health. 2022. 10.1016/j.sleh.2022.07.005

35. Campbell JC, Webster D, Koziol-McLain J, et al. Risk factors for femicide in abusive relationships: Results from a multisite case control study. Am J Public Health. 2003;93:1089–97. [PubMed: 12835191]

36. Dichter ME, Makaroun L, Tuepker A, True G, Montgomery AE, Iverson K. Middle-aged Women's Experiences of Intimate Partner Violence Screening and Disclosure: "It's a private matter. It's an embarrassing situation". J Gen Intern Med. 2020;35(9):2655–61. 10.1007/s11606-020-05947-3 [PubMed: 32514900]

37. Makaroun LK, Brignone E, Rosland AM, Dichter ME. Association of Health Conditions and Health Service Utilization With Intimate Partner Violence Identified via Routine Screening Among Middle-Aged and Older Women. JAMA Netw Open. 2020;3(4):e203138. 10.1001/jamanetworkopen.2020.3138 [PubMed: 32315066]

38. Martin JL, Schweizer CA, Hughes JM, et al. Estimated Prevalence of Insomnia among Women Veterans: Results of a Postal Survey. Womens Health Issues. 2017;27(3):366–73. 10.1016/j.whi.2016.12.003 [PubMed: 28110799]

39. Jones HJ, Zak R, Lee KA. Sleep Disturbances in Midlife Women at the Cusp of the Menopausal Transition. J Clin Sleep Med. 2018;14(7):1127–33. 10.5664/jcsm.7208 [PubMed: 29991421]

40. McCurry SM, Guthrie KA, Morin CM, et al. Telephone-Based Cognitive Behavioral Therapy for Insomnia in Perimenopausal and Postmenopausal Women With Vasomotor Symptoms: A MsFLASH Randomized Clinical Trial. JAMA Intern Med. 2016;176(7):913–20. 10.1001/jamainternmed.2016.1795 [PubMed: 27213646]

41. Drake CL, Kalmbach DA, Arnedt JT, et al. Treating chronic insomnia in postmenopausal women: a randomized clinical trial comparing cognitive-behavioral therapy for insomnia, sleep restriction therapy, and sleep hygiene education. Sleep. 2019;42(2). 10.1093/sleep/zsy217

42. Miller E, McCaw B. Intimate Partner Violence. N Engl J Med. 2019;380(9):850–7. 10.1056/
NEJMra1807166 [PubMed: 30811911]

**Table 1.**

Sample characteristics ($N = 232$)

|  | n (%) |
|---|---|
| **Demographic characteristics** | |
| Age (mean, SD) | 55.95 (5.13) |
| Race | |
| White | 172 (74.1) |
| Black or African American[a] | 24 (10.3) |
| Asian[a] | 9 (3.9) |
| Native Hawaiian or Other Pacific Islander[a] | 4 (1.7) |
| American Indian or Alaska Native[a] | 9 (3.9) |
| Other[a,d] | 8 (3.4) |
| Ethnicity | |
| Hispanic or Latina | 24 (10.3) |
| Not Hispanic or Latina | 208 (89.7) |
| Education | |
| Some college or less | 119 (51.3) |
| College degree | 37 (15.9) |
| Some graduate school or graduate degree | 76 (32.8) |
| Postmenopausal | 191 (82.3) |
| BMI (mean, SD) | 29.71 (7.03) |
| PHQ-9, Clinically significant depressive symptoms (≥10) | 77 (33.2) |
| PCL-5, Probable PTSD (≥33) | 63 (27.4) |
| Insomnia Severity Index | |
| None (0–7)[b] | 69 (29.7) |
| Subthreshold (8–14)[b] | 80 (34.5) |
| Clinical Insomnia--Moderate (15–21)[c] | 56 (24.1) |
| Clinical Insomnia—Severe (22–28)[c] | 27 (11.6) |
| E-HITS Intimate Partner Violence (IPV; lifetime) | |
| IPV exposure | 147 (63.4) |
| Physical IPV | 81 (34.9) |
| Sexual IPV | 62 (26.7) |
| Psychological IPV | 121 (52.2) |

[a, b, c] Detailed for presentation purposes; these categories were collapsed in primary analyses.

[d] Participants self-selected racial identities from these categories and could select as many as applicable. Of participants who only selected "Other", further self-identification in free text included "Mexican-Cuban" (n=1), "Mexican American" (n=1), "Hispanic" (n=2), "Latina" (n=2), and "human" (n=1).

BMI: body mass index; E-HITS: Expanded Hurt, Insult, Threaten, Scream screening tool; IPV: intimate partner violence; PCL-5: PTSD Checklist for DSM 5; PHQ-9: Patient Health Questionnaire-9 item.

**Table 2.**

Adjusted odds of self-reported moderate-severe clinical insomnia symptoms in women reporting lifetime IPV

|  | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
|  | OR (95% CI) | OR (95% CI) | OR (95% CI) | OR (95% CI) |
| Probable IPV | 3.24 (1.57–6.69) | 2.87 (1.31–6.31) | 3.10 (1.48–6.52) | 2.88 (1.31–6.33) |
| Physical IPV | 2.01 (1.09–3.70) | 1.54 (.78–3.01) | 1.82 (.96–3.44) | 1.55 (.78–3.07) |
| Sexual IPV | 2.09 (1.08–4.07) | 1.78 (.86–3.70) | 1.89 (.94–3.79) | 1.78 (.85–3.72) |
| Psychological IPV | 3.98 (2.06–7.71) | 3.16 (1.54–6.50) | 3.68 (1.87–7.22) | 3.16 (1.54–6.50) |

Model 1: Adjusted for demographic characteristics (age, race/ethnicity, education), BMI, and menopause status.

Model 2: Adjusted for demographic characteristics, BMI, menopause status, and clinically significant depressive symptoms (PHQ > 10).

Model 3: Adjusted for demographic characteristics, BMI, menopause status, and probable PTSD (PCL 33).

Model 4: Adjusted for demographic characteristics, BMI, menopause status, clinically significant depressive symptoms (PHQ > 10), and probable PTSD (PCL 33).

BMI: body mass index; IPV: intimate partner violence; OR: odds ratio; PCL-5: PTSD Checklist for DSM 5; PHQ-9: Patient Health Questionnaire-9 item; PTSD: posttraumatic stress disorder.