Effects of violence against women on health during menopause: a systematic review and meta-analysis

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Objective(s): This review aimed to respond to the question of how a history of violence against women (VAW) influences their health during menopause. Mechanism: We searched all articles (published in peer-reviewed journals up to March 2021) related to menopausal symptoms, sexual dysfunction, and chronic complications in post-menopausal women affected by VAW. Findings in brief: The literature search strategy identified 194 articles, of which 19 were selected for analysis. All articles described cross-sectional or cohort studies concerning menopausal or genitourinary symptoms, psychological health, physical conditions, sexual health, and cardiovascular or metabolic problems. The analyzed data set included 16436 women who reported experiencing violence in the USA, Brazil, and Australia. The combined data on the effect of VAW on menopausal symptoms suggest that the risk of suffering from such effects is 1.51 (95% CI: 1.23–1.86), while for sexual health, the risk was 1.4875 (95% CI: 1.2060–1.8346). Conclusions: A history of VAW increases the symptoms of menopause and worsens the physical conditions and sexual and psychological health after the age of 40. Thus, it is essential to investigate these antecedents in routine clinical practice when treating menopausal women with additional symptoms and to warn of the long-term general health risks for any woman who has experienced an episode of violence.

Keywords
Violence against women, Sexual violence, Intimate partner violence, Gender-based violence, Sexual violence, Menopause

1. Introduction

Violence against women (VAW) includes all acts of physical and psychological violence, including intimate or gender-based violence, sexual assaults, abuse, threats, coercion, or arbitrary deprivation of liberty [1]. Although accurate data are not available on the percentage of women who have been victims of VAW, the latter is a common worldwide problem, and it is estimated that at least one in four women who reach menopause has suffered from such violence [2].

In Spain, the scale of the problem of VAW can be illustrated by the fact that, a rape is reported every five hours, and more than a million women have suffered violence in the last decade. Moreover, since records first began, more than a thousand women have been murdered by their partners or ex-partners, and further cause for concern comes from the estimated number of those women who have suffered some degree of severe disability due to violence, which, in the best-case scenario, exceeds 400,000 [3].

Given the deterioration in endocrine function observed in women who have suffered VAW, it is crucial to determine if VAW can generate prolonged endocrine effects years after the violence has occurred. In this regard, the hormonal deficits caused by these situations may be temporary or permanent, but their consequences are, in any case, the same as those of hypoestrogenism suffered by women with persistent central amenorrhea or early menopause [4]. In addition, it has been suggested that a history of VAW can advance the onset of perimenopausal disorders or reduce hormonal levels, suggesting a link between neuroendocrine disorders and hypoestrogenism [5].

It is thus necessary to determine how VAW influences health during perimenopause or post-menopause, including the symptoms experienced during this period (e.g., vasomotor symptoms, psychological effects, and insomnia) and the long-term consequences (cardiometabolic, bone, cognitive, psychological, and psychosocial effects). Women who have suffered violence, particularly of a sexual nature, present more urinary symptoms, as well as a deterioration of their physical condition and psychological health [6].

Other conditions appear to be exacerbated by VAW, including sexually transmitted infections, the risk of which doubles in women who have suffered from violence [7], while VAW is also associated with an increased risk of preinvasive and invasive cervical cancer (2.6-fold increase in the likelihood of a late-stage diagnosis) [8].

This work aimed to provide a systematic review to respond to the following question: “How does the history of violence against women influence health during menopause?”

2. Methods

The study was registered at PROSPERO.org¹.

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2.1 Search strategy

We searched the Scientific Information Web of Knowledge (MEDLINE, Pubmed, Scopus, and Cochrane databases) for all articles (in any language) published in peer-reviewed journals up to March 2021 using the search strategy described in Appendix A. The search criteria were applied to each database and combined with the available database-specific filters. Other publications were identified by manually searching through a reference list of papers highlighted by the search and critical reviews. Press reports published in peer-reviewed journals and reports available online before publication were also considered.

2.2 Eligibility criteria

The PICOS (Population, Intervention exposure, Comparators, Outcomes, and Study Designs) criteria were established a priori to guide the scope of the review, along with the procedures, selection, and synthesis of the literature search. The selection criteria were as follows: (Population) perimenopausal or postmenopausal women affected by any type of VAW (Exposure); (Comparators) women not exposed to violence; (Outcome) primary outcomes: quality of life, menopausal symptoms, sexual symptoms, sexual dysfunction, chronic complications (cardiovascular disease, osteoporosis, cognitive impairment; (Study Design) clinical studies.

Any complete article that met the inclusion criteria was reviewed in detail. Other related publications are for reference purposes only.

2.3 Data extraction

We synthesized the evidence according to PRISMA guidelines [9]. In the selected articles, data related to the study design, the sample size, the age of the women, the type of violence suffered, and the vascular, vaginal, sexual, or psychological symptoms experienced were extracted. The authors created the extraction form according to the PICOS framework.

2.4 Risk of bias assessment

The risk of bias was assessed according to the type of study considered. We restricted the inclusion of systematic reviews to those assessing the risk of bias of their included measures and those reporting explicit judgments. Risk of Bias assessment and pooled analyses were conducted using the Begg and Egger tests included within the Epidat 3.1 software statistical package (SERGAS, Xunta de Galicia, Spain).

2.5 Pooled analyses

Pooled analyses were conducted using the Mantel-Haenszel method and the random-effects model using the Epidat 3.1 software statistical package.

Heterogeneity was calculated using the DerSimonian and Laird procedure and was represented graphically using the Galbraith graph. A value of $p = 0.05$ was adopted as the threshold for statistical significance.

A sensitivity analysis with a random-effects model was conducted to determine the reliability and robustness of the overall result obtained. Begg and Egger’s tests were conducted to ensure the absence of publication bias when selecting the articles included in the meta-analysis.

3. Results

The literature search strategy identified 194 articles, of which 117 were excluded at various stages of the search, eventually producing a final selection of 19 articles (Fig. 1), five of which were related to menopausal symptoms [10–14], two related to genitourinary symptoms [15, 16], five studies on psychological health or physical conditions [17–21] three on sexual health [22–24], and four on cardiovascular or metabolic problems [25–28]. Nine studies were cross-sectional studies [12–17, 19, 22, 23] and ten were cohort studies [10, 11, 18, 20, 21, 24–28]; two Brazilian [11, 22], two Australian [17, 24] and the rest from USA. For the analysis, all forms of psychological, physical, or sexual mistreatment or abuse were combined into a single category of VAW. The analyzed data set included 16,436 women who reported experiencing violence and 259,150 who did not.

![Fig. 1. Flow chart.](image)

Table 1 (Ref. [10–28]) displays a summary of the main characteristics of the selected studies (study design, population, intervention, objective, and main results). The participants’ mean age or age range was reported in all articles, but not the time since the violence episode, which was described in only one study [11].

The combined data on the effect of VAW on menopausal symptoms was 1.51 (95% confidence interval (CI): 1.23–1.86; Fig. 2), while for vaginal symptoms or sexual health, the risk was 1.49 (95% CI: 1.21–1.83; Fig. 3). The lack of data did not allow a combined analysis of other signs or symptom.

Moreover, there was no statistical evidence of publication bias (as confirmed by Begg and Egger tests), and the overall findings were not influenced by the removal of any study from the meta-analysis (sensitivity analysis, Fig. 4).
Fig. 2. Menopausal symptoms.

Fig. 3. Sexual health and vaginal symptoms.

Fig. 4. Publication Bias.
| Authors          | Study design | Population                          | Violence | Objective                                                          | Main results                                                                 |
|------------------|--------------|-------------------------------------|----------|--------------------------------------------------------------------|------------------------------------------------------------------------------|
| **Menopausal symptoms**                                                                                           |
| Thurston et al. 2008 [10]                                    | Cohort study | 116 women with violence history     | SV       | Any/no menopausal symptoms symptoms (hot flashes and night sweats) | SV increased hot flashes and night sweats                                    |
|                  |              | Age: 42–52 216 controls            |          |                                                                    |                                                                               |
| Moraes et al. 2012 [11]                                      | Cohort study | 124 women with violence history     | IPV/SV   | menopausal symptoms (Kupperman Menopausal Index)                    | IPV/SV increased menopausal symptoms                                         |
|                  |              | Age: 40–65 120 control              |          |                                                                    |                                                                               |
| Vegunta et al. 2016 [12]                                     | Cross-sectional study | 253 women with violence history   | SV       | menopausal symptoms symptoms (Menopause Health Questionnaire)       | SV increased menopausal symptoms                                             |
|                  |              | Age > 40 3489 controls             |          |                                                                    |                                                                               |
| Carson et al. 2019 [13]                                      | Cross-sectional study | 130 women with violence history | SV       | Any/no menopausal symptoms symptoms (vaso-motor symptoms: hot flashes, night sweats) | SV increased sleep vasomotor symptoms                                         |
|                  |              | Age: 40–60 165 controls             |          |                                                                    |                                                                               |
| Gibson et al. 2019 [14]                                      | Cross-sectional study | 423 women with violence history | IPV/SV   | menopausal symptoms (difficulty sleeping, hot flashes, night sweet) | IPV/SV increased difficulty sleeping, night sweats and vaginal symptoms       |
|                  |              | Age: 40–80 1593 controls            |          |                                                                    |                                                                               |
| **Genitourinary symptoms**                                   |              |                                     |          |                                                                    |                                                                               |
| Gibbson et al. 2019 [15]                                     | Cross-sectional study | 428 women with violence history   | SV       | Genitourinary symptoms                                              | SV increased vaginal symptoms and urinary incontinence                        |
|                  |              | Age: 57–85 1123 controls            |          |                                                                    |                                                                               |
| Boyd et al. 2019 [16]                                        | Cross-sectional study | 400 women with violence history | IPV/SV   | Genitourinary symptoms                                              | IPV increased weekly incontinence, stress-type incontinence, urgency-type incontinence and nocturia |
|                  |              | Age: 40–80 1500 controls            |          |                                                                    | SV did not increase incontinence or nocturia                                 |
|                  |              |                                     |          |                                                                    |                                                                               |
| **Psychological Health/health conditions**                   |              |                                     |          |                                                                    |                                                                               |
| Loxton et al. 2006 [17]                                      | Cross-sectional study | 2165 women with violence history | IPV      | Primary: Physical conditions                                        | IPV caused a worsening of physical conditions                                 |
|                  |              | Age: 40–50 11813 controls           |          |                                                                    |                                                                               |
| Mouton et al. 2010 [18]                                      | Cohort study | 10389 women with violence history  | IPV/SV   | Psychological health                                                | SV have poorer psychological health                                          |
|                  |              | Age: 50–79 82636 controls           |          |                                                                    |                                                                               |
| Cannell et al. 2015 [19]                                     | Cross-sectional Study | 1569 women with violence history | IPV/SV   | Physical functioning                                                | IPV/SV diminished physical functioning                                       |
|                  |              | Age: 50–79 153,333 controls         |          |                                                                    |                                                                               |
| Authors                      | Study design        | Population                                      | Violence | Objective                | Main results                                                                 |
|------------------------------|---------------------|-------------------------------------------------|----------|--------------------------|------------------------------------------------------------------------------|
| Mitchell & Woods 2017 [20]   | Cohort study        | 80 women with violence history                   | SV       | Depressed mood           | SV increased depressed mood                                                  |
| Makaroum et al. 2020 [21]    | Cohort study        | 334 women with violence history                  | IPV/SV   | Health Conditions        | IPV/SV increase morbidity and health service utilization                     |
| **Sexual Health**            |                     |                                                 |          |                          |                                                                               |
| Dombek et al. 2016 [22]      | Cross-sectional     | 50 women with violence history                   | SV/IPV   | Sexual Health            | SV increased sexual disfunctions                                              |
| Kelley et al. 2019 [23]      | Cross-sectional     | 9410 women with violence history                 | SV       | Sexual Health            | SV increased sexual dissatisfactions                                           |
| Howard et al. 2006 [24]      | Cohort study        | 108 women with violence history                  | SV       | Sexual Health            | SV decreased satisfaction                                                    |
| **Cardiovascular or metabolic issues** |                     |                                                 |          |                          |                                                                               |
| Matthews et al. 2014 [25]    | Cohort study        | 116 women with violence history                  | SV       | Primary: obesity.        | SV was related to CRP change but not BMI changes.                            |
| Secondary: CRP levels        |                     |                                                 |          |                          |                                                                               |
| Midei et al. 2014 [26]       | Cohort study        | 116 women with violence history                  | SV       | Metabolic syndrome       | No relation                                                                  |
| Fernandez et al. 2011 [27]   | Cohort study        | 46 women with violence history                   | IPV      | Pro-inflammatory markers | No relation                                                                  |
| Thurston et al. 2014 [28]    | Cohort study        | 643 women with violence history                  | IPV/SV   | CVD risk (carotid IMT)   | Only childhood SV increased carotid IMT                                      |

Abbreviations, BMI, Body mass index; CRP, C reactive protein; CVD, cardiovascular disease; IPV, intimate partner violence; SV, sexual violence; IMT, carotid intima media thickness; SD, standard deviation.
4. Discussion

This article presents the first systematic review and meta-analysis to evaluate the effects of VAW (experienced at any time before menopause) on women’s health during menopause. Overall, our findings indicate that VAW has a significant impact on menopausal symptoms and sexual health. In addition, women who have suffered violence, particularly sexual nature, presented more urinary symptoms and a worsening of their physical condition and psychological health.

As previously noted, for analytical purposes, we have considered all possible forms of VAW. These include verbal, emotional, physical, or sexual abuse, which can occur within or outside of a partner relationship since we consider that the link between neuroendocrine function and the appearance of menopausal symptoms and health problems in this period is the same for all types of abuse.

Despite the growing awareness of the importance of VAW (in any of its forms) for women’s general health, relatively few studies have adequately investigated the long-term effects of this type of violence, particularly on health problems during middle age and later life, that is, the postmenopausal period.

Further cause for concern comes from the estimated number of those women who have suffered some degree of severe disability due to VAW. This figure rises considerably if we consider other less severe or “silent” disabilities, many of which have a clinical presentation similar to the symptoms of menopause [3].

However, although the literature is scarce, some studies have observed the consequences of VAW on long-term gynecological health, which are broadly similar to the symptoms that occur after hypoestrogenism [5]. The neuroendocrine connection between VAW and hypoestrogenism is the same as that observed in high-stress situations that cause central amenorrhea, in addition to the psychological or sexual consequences, which are similar to those caused by posttraumatic stress disorders [29–31].

In another sense, questions about VAW are generally not raised by women [32], or not asked by doctors [33]. Although these are two different issues, both highlight the need for health care providers to add VAW issues to the list of actions for promoting gender-transformative approaches in the sustainable development goals to improve health [34].

Moreover, the necessary and strict confinements imposed by authorities in response to the COVID-19 pandemic have impacted the general health of women, whose care has not met the standards that had previously been set by scientific societies [35, 36].

Our review is the first to systematically address the research conducted on the influence of VAW in any of its forms on women’s health during menopause, although other narrative reviews have provided updates on this topic [37, 38].

This systematic review has gathered the available evidence on the effects of VAW on women’s health during menopause. This review was not limited to sexual or gender-based violence but instead was expanded to include the registry of publications on other forms of abuse to provide a broader perspective of the influence of abuse on the health of menopausal women.

Our search identified 19 studies that included data on the impact of VAW on menopausal symptoms or other health problems commonly experienced during this period, such as genitourinary, psychological, sexual, and physical conditions. According to the data reported by Vegunta et al. [12], associations have been observed between VAW and adiposity, metabolic syndrome, and subclinical cardiovascular disease in middle age. Some of the studies included in this review [12] found that women who admitted having suffered abuse presented more menopausal symptoms when adjusting the data for possible confounding and demographic factors, reinforcing the idea that VAW affects women regardless of age, ethnic origin, or socioeconomic status.

Of particular interest are the data that indicate an increase in nocturnal vasomotor symptoms shown by women who have suffered violence [10, 13, 14]. Sleep disturbances may be due to problems other than the night sweats experienced by many women during menopause, which can be explained by heart rate variability or disturbances of the sympathetic nervous system and the hypothalamic-pituitary-adrenal axis. Relatively little is still known about the neurobiology of hot flashes and their nocturnal manifestations, but what is fascinating is the possibility that childhood trauma or VAW could determine a women’s physiology from infancy to the postmenopausal stage of life.

Thus, it appears that violence suffered in the early stages of a woman’s life (as early as infancy) could impact reproductive health in the medium term, such as the pregnancy/perinatal period [39]. VAW has been associated with increased long-term health risks, including chronic pelvic pain, migraines, low back pain, irritable bowel syndrome, anxiety, depression, drug and alcohol use, somatization, and poor sexual function. Certain health-related behaviors have also been linked to VAW in childhood, such as eating disorders, obesity, or smoking [40].

In addition — and although not included in this review — other studies have shown that a history of VAW can advance the onset of perimenopausal disorders, lower the age of menopause onset, or reduce hormonal levels. These observations support the notion of a link between neuroendocrine disorders and hypoestrogenism. Another key study found that a history of VAW was associated with an increased risk of undergoing a bilateral oophorectomy and, consequently, presenting symptoms associated with hypoestrogenism [41, 42]. The experience of VAW is common among American women, and its association with late diagnosis of advanced stage female cancers (breast, ovary, endometrium) has been reported [8].
5. Limitations

The main limitation of this review stems from the low quality of the selected studies. These are cross-sectional studies, some of which are classified as cohorts by their authors, with considerable clinical heterogeneity in their designs. Furthermore, the most recognized limitations in the studies include the small sample size, the use of retrospective self-reports of the symptoms suffered, and the lack of data on the intensity of the menopausal symptoms, particularly vasomotor symptoms.

However, despite obtaining a high score on the test of heterogeneity, we could consider this result to be informative since it indicates the high degree of dispersion in the effects reported in the studies reviewed here.

6. Conclusions and future research

This review contributes to the literature on VAW and suggests that we should consider implementing an ongoing screening program for VAW, even after reproductive age and before the onset of menopausal symptoms or deterioration of sexual function. This review provides further evidence that women who have suffered VAW and have reached menopause are at greater risk of experiencing deterioration in their health. Moreover, aside from the direct physical or psychological consequences of VAW, most of these women are at greater risk of suffering from other less severe disabilities (injury, chronic pain, depression, and posttraumatic stress disorder), which are, nonetheless, sufficiently disturbing to warrant consideration as part of their clinical care.

In conclusion, a history of VAW increases the symptoms of menopause and worsens the physical conditions and the sexual and psychological health of these women when they reach middle age. Therefore, it is essential to consider these antecedents as part of our routine clinical practice when treating menopausal women with excessive symptoms and warn of the general long-term health risks faced by all women who have suffered an episode of VAW in their lifetime.

Author contributions

LMH, IGJ, NM: conception and design of the idea. LMH, NM Selection of studies, Data extraction and preparation of manuscript. IGJ: Data extraction and pooled analyses. All authors participated in data interpretation, statement and approved the final version of the manuscript.

Ethics approval and consent to participate

Not applicable.

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Conflict of interest

The authors declare no conflict of interest.

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