Iran Red Crescent Med J. 2017 April; 19(4):e43952. doi: 10.5812/ircmj.43952.

Published online 2017 January 9. **Review Article**

A Systematic Review of Prevalence of Vasomotor and Sexual Symptoms Among Iranian Middle-Aged Women

Maryam Masoumi,[1] Marzieh Azizi,[1] Zoleikha Atarod,[2] Pragya Gartoulla,[3,4] Fatemeh Abdollahi,[5] and Ensieh Fooladi[3,4,*]

[1]Student Research Committee, School of Nursing and Midwifery, Mazandaran University of Medical Sciences, Sari, Mazandaran, Iran
[2]Department of Obstetrics and Gynecology, Imam Khomeini Hospiotal, Mazandaran University of Medical Sciences, Sari, Mazandaran, Iran
[3]Women's Health Research Program, School of Public Health and Preventive Medicine, Monash University, Melbourne, Victoria, Australia
[4]Sexual and Reproductive Health Research Centre, School of Nursing and Midwifery Mazandaran University of Medical Sciences, Sari, Mazandaran, Iran
[5]Department of Public Health, Psychiatry and Behavioral Sciences Research Center, Mazandaran University of Medical Sciences, Sari, Iran

[*]*Corresponding author*: Ensieh Fooladi, Sexual and Reproductive Health Research Centre, School of Nursing and Midwifery Mazandaran University of Medical Sciences, Sari, Mazandaran, Iran. Tel: +98-9113554558, E-mail: ensieh.fooladi5@gmail.com

Received 2016 November 14; **Revised** 2016 December 07; **Accepted** 2017 January 01.

Abstract

Context: The aim of this study was to systematically review published articles reporting on the prevalence of vasomotor and sexual symptoms in Iranian women.

Evidence Acquisition: Five databases including MEDLINE, PsycINFO, CINAHL, SCOPUS and Google scholar, as well as four Iranian databases including SID, Iranmedex, IranDoc and Magiran were searched during July 2016 to retrieve studies reporting on the prevalence of vasomotor and sexual symptoms in Iranian middle-aged women. Risk of bias was assessed using a standard risk of bias tool.

Results: Twelve independent studies met our inclusion criteria and provided data for this review. The prevalence of vasomotor and sexual symptoms was high although the ranges were wide. This might be due to utilization of different study designs, methods of recruitment, instruments, and the time frame over which symptoms were assessed. There was a lack of information in most studies on the severity of symptoms as an important determining factor for clinical use. In addition, distress associated with sexual symptoms has not been assessed by any study. High risk of bias was observed for the eleven studies for both external and internal validity.

Conclusions: High quality research is needed to establish the true portray for the prevalence and severity of vasomotor and sexual symptoms associated with distress in Iranian women.

Keywords: Prevalence, Menopausal Symptoms, Iranian, Middle-Aged, Review

1. Context

Due to decline in estrogen levels during menopause, women may experience different physical, vasomotor (VMS; hot flashes and night sweats), psychological and sexual symptoms. However, prevalence of menopausal symptoms varies in different societies and ethnic groups (1-6).

With increasing life expectancy among Iranian women, there is a need for identifying and addressing issues, which they might encounter during and after menopause. Therefore, a number of studies were undertaken in various parts of Iran. In a recent literature review of the prevalence of menopausal symptoms in Asian middle-aged women (7), one study (8) from Iran was included, since only English-language studies were reviewed. Due to publication bias, a true portray of the prevalence of menopausal symptoms in Iranian middle-aged women might not be presented. The aim of this review was, therefore, to retrieve all published Persian and English-language articles reporting on the prevalence of vasomotor and sexual symptoms among Iranian middle-aged women, to summarize the findings of these studies, and to assess their quality using a standard risk of bias tool.

2. Methods

In this review, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was used as a guideline (9).

2.1. Search Strategy

English electronic databases including Ovid MEDLINE, PsycINFO, CINAHL, SCOPUS and Google scholar and four Iranian databases including SID, Iranmedex, IranDoc and Magiran were searched for English and Persian-language articles. The latest search was performed in July 2016.

Our search term combination was as follows: MeSH headings, text words and word variants for "menopause

(Yaesegi)" or "climacteric" or "perimenopause (Holohoshe-Yaesegi)" or "postmenopause" or "menopausal symptoms" or "vasomotor symptoms" "sexual symptoms" and "prevalence" or "incidence" or population-based" or "community survey" "clinic-base" or "epidemiology" and "Iran" or "Iranian". Reference lists of included studies were inspected manually to identify additional relevant articles. Four reviewers (Ensieh Fooladi, Zoleikha Atarod, Maryam Masoumi and Marzieh Azizi) assessed the titles and abstracts of all retrieved references separately to identify studies that appeared to fulfill the inclusion criteria. All potentially eligible articles were identified and retrieved in full-text.

2.2. Selection Criteria

All indexed and non-indexed original cross-sectional or longitudinal studies that reported on the prevalence of vasomotor and sexual symptoms in Iranian women were retrieved, irrespective of the definition of menopause, types of menopause, recruitment method, instruments used for the assessment of menopausal symptoms, and the year of publication. Studies, which were reviews, reported on the results of clinical trials, included women using menopause hormone therapy (MHT) while reporting menopausal symptoms or included women with co-morbidities (breast cancer or osteoporosis), were excluded from our review.

2.3. Data Extraction and Management

Relevant information was extracted independently by Maryam Masoumi and Marzieh Azizi into descriptive tables and was cross-checked by the third and fourth reviewers (Ensieh Fooladi and Zoleikha Atarod). Consensus was reached before final inclusion of the papers. Extracted variables included the following: first author, publication year, city, items ranked high on the risk of bias tool, sampling method, sample size, age, instrument used, type of menopause and menopausal symptoms. For studies that did not utilize a validated tool for assessing menopausal symptoms, validated instruments, such as green climacteric scale (GCS) and menopause-specific quality of life (MENQOL) were used for categorizing menopausal symptoms (10).

2.4. Risk of Bias Assessment

In order to assess the risk of bias, we used a reliable risk of bias tool developed by Hoy et al. (11). Testing of the tool indicated its validity and reliability. There was an overall high inter-rater agreement of 91% and the Kappa statistic of 0.82 (95% confidence interval: 0.76, 0.86). According to the study of Hoy et al., agreement was almost perfect for the individual items on the tool and moderate for the summary assessment (11). The tool consists of 10 items, all rated as high or low risk: 1) representativeness of study sample; 2) target population representativeness; 3) sample selection method; 4) probability of non-response bias; 5) data collection method; 6) acceptable case definition used; 7) validity and reliability of the study instruments, 8) standardization of data collection; 9) appropriate length of prevalence period; and 10) presence of error in calculating or reporting the numerator and/or denominator of the study parameter. Items 1 to 4 assess the external validity of the study (domains are selection and non-response bias), and items 5 to 10 assess the internal validity (items 5 to 9 assess the domain of measurement bias, and item 10 assesses bias related to the analysis). Item 11 is the summary item on the overall risk of study bias. For this item, studies were classified as presenting low risk of bias when at least 9 criteria were met, moderate risk of bias for studies that met 7 or 8 criteria, and high risk of bias when the studies met less than 7 criteria. To ensure that the criteria of risk of bias were applied consistently for each included study, two reviewers (Ensieh Fooladi and Zoleikha Atarod) re-assessed the risk of bias results.

2.5. Definition of Menopause

In this review, we adopted the stages of reproductive aging workshop (STRAW) definition for reproductive aging (12). Menopause is defined after 12 or more months of amenorrhea following the final menstrual period (FMP). Early post-menopause is defined as 1 to 5 years of FMP, and late post-menopause as more than 5 years since the FMP. Peri-menopause is characterized by increased variability in menstrual cycle length (early stage) or two or more missed periods and the occurrence of amenorrhea of 60 days or longer (late stage).

3. Results

3.1. Search Results

Figure 1 provides detailed results of the literature search and study selection process. The literature search identified 2538 potentially relevant articles for review from both English and Persian databases (Figure 1). After excluding duplicate records, 538 titles and abstracts were screened for eligibility. Of these, 497 studies were excluded because they were either a clinical trial, conducted outside Iran or included women with co-morbidities. This resulted in the remaining 41 articles for the full-text review. However, 29 articles were excluded after full review: 6 included women on MHT, 17 reported means, and 4 reported associations without data on the prevalence of menopausal symptoms. After reading the full text, two articles were excluded

from the review because information regarding VMS and sexual symptoms were not provided (13, 14). Overall, 12 individual original studies were included in our systematic review (8, 15-25).

3.2. Description of Included Studies

An overview of included studies is provided in Tables 1 and 2 (8, 15-25). Studies were published between 2001 and 2015. Seven studies were written in English (8, 15-17, 19, 24, 25) and the remaining were in Persian. Sample size varied from 60 to 1397 participants, with a total number of 5650 women. All studies collected data through face to face interviews or self-administered questionnaire using a cross-sectional study design. One study was conducted in the capital city of Iran (Tehran) (17), and the remaining in other cities of Iran. The age of women included in the studies ranged from 40 to 78 years, however, three studies did not report the age of the women (17, 21, 23). All studies included women with natural menopause except two studies, in which the menopause type was not specified (23, 25). Three studies reported symptoms of menopause in three categories of pre-, peri- and postmenopausal stages (18, 20, 25). Eight studies included only postmenopausal women (8, 15, 17, 19, 21-24). Only one study provided data on symptoms of peri- and post- but not for the pre-menopausal group (16). Three studies used the STRAW definition to classify menopause status (16, 18, 20), while four studies used the world health organization (WHO) criteria (8, 17, 24, 25). However, in two studies women were considered postmenopausal if they had 12 months of amenorrhea or had an FSH level higher than 30 pg/mL (21, 22). One study used incorrect criteria for the definition of menopause, which was 2 to 7 years of amenorrhea (19). The remaining studies did not provide details on how menopausal status was determined (15, 23). All studies included naturally postmenopausal women except two, which did not mention the type of menopause (23, 25). Seven studies did not specifically state that women using MHT had been excluded (8, 17, 18, 20-23). Three studies specified that women using MHT had been excluded (15, 19, 24, 25). In one study, although HRT use was not mentioned as an exclusion criterion, no participant reported its use (16). In three studies in which pre- and perimenopausal women participated, the use of OCP was unspecified (16, 18, 20).

Four studies employed random sampling from the community (8, 15, 16, 19), while, the other eight studies, selected patients from menopause clinics or from a list of women available at primary health care centers (17, 18, 20-25).

Candidates were asked if they experienced menopausal symptoms in the past two weeks in one study (16), in the past month in four studies (15, 19, 24, 25), and in the past 6 months in one study (18). Lifetime experience of menopausal symptoms was asked in one study (8). There was no description of duration of menopausal symptoms in the five studies (17, 20-23).

3.3. Vasomotor Symptoms

Table 1 shows information on the prevalence of vasomotor symptoms (VMS) reported in 12 studies. The study sample sizes ranged from 134 to 1397. Four studies reported VMS including hot flashes, night sweats and sweating (15, 19, 24, 25), three studies reported hot flashes and night sweats (17, 18, 20), and five studies provided data only for hot flashes (8, 16, 21-23). Eight studies reported VMS only for postmenopausal women (8, 15, 17, 19, 21-24), one study reported VMS (only hot flashes) for peri- and postmenopausal women (16), and three studies reported the prevalence of VMS by menopause status (18, 20, 25). Six studies did not utilize validated tools (8, 17, 20-23). Eight studies used validated questionnaires (15, 16, 19, 24, 25). No study used VMS diary for recording VMS.

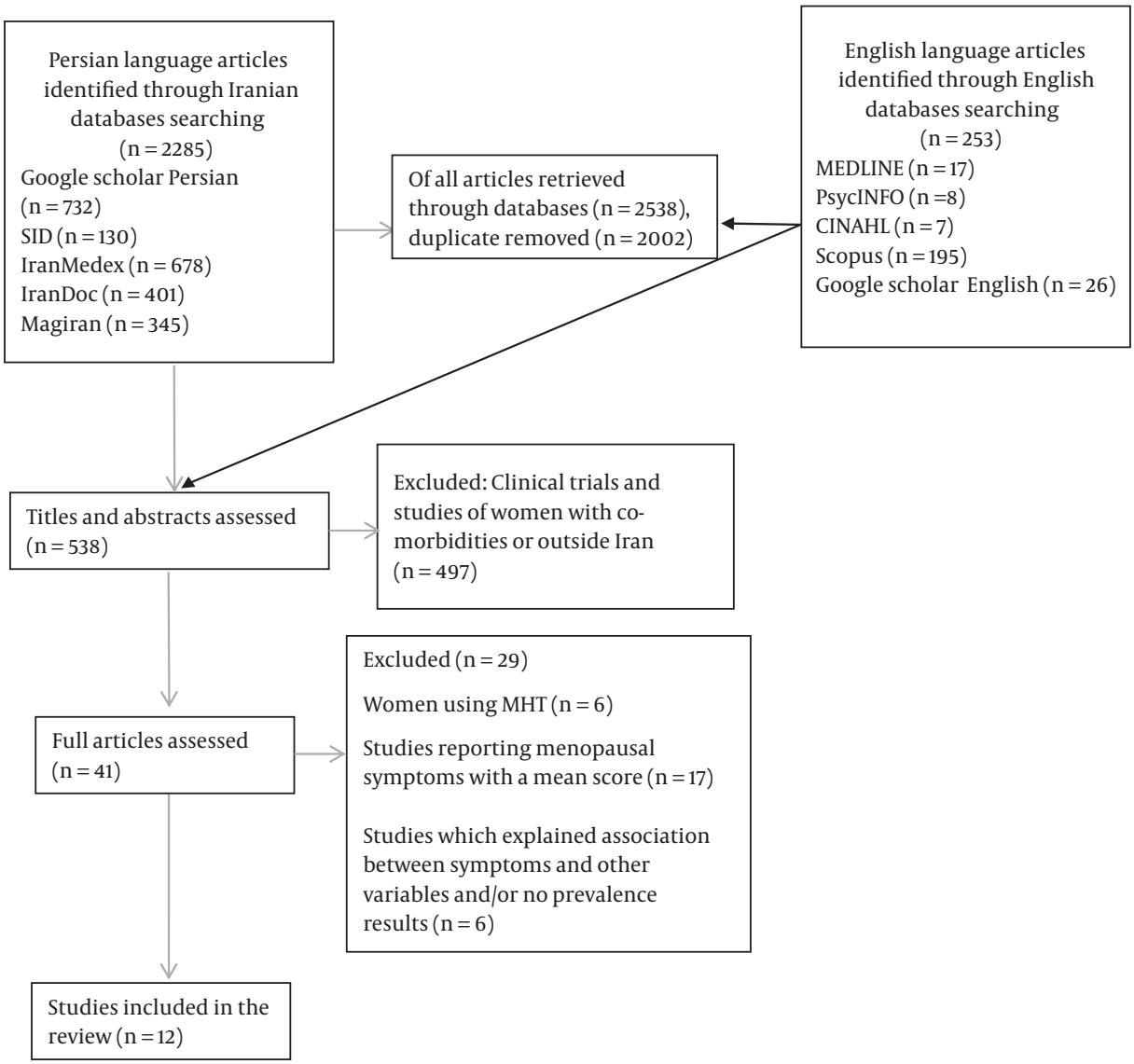
For premenopausal women, the reported prevalence for hot flashes varied from 31.4% to 33.2% (18, 25), and for night sweats, from 2.4 to 23.2% (18, 20). The prevalence of hot flashes and night sweats for peri-menopausal women ranged from 39% to 70.0% and from 20.3% to 51.2%, respectively. The prevalence of hot flashes for postmenopausal women in the various studies ranged between 58.4 % and 80.9%, and for night sweats, between 24.9% and 86.1%.

Thus, the published studies reported a wide range for the prevalence of VMS and there was substantial overlap in VMS for perimenopausal and postmenopausal women. Apparently, the prevalence of VMS was higher in postmenopausal women than perimenopausal and postmenopausal groups, and also in postmenopausal women the prevalence was high with a wide range.

3.4. Sexual Symptoms

Twelve individual studies reported data on the prevalence of sexual problems in women at midlife (Table 2). Sexual problems included loss of interest in sex, change in or reduced sexual desire, avoiding intimacy, vaginal dryness and dyspareunia. Nine studies reported prevalence of vaginal dryness of which three reported prevalence according to menopause status (18, 20, 25). Six studies used invalidated questionnaires to assess the prevalence of sexual problems (8, 17, 20-23). The reported prevalence of vaginal dryness for premenopausal, perimenopausal and postmenopausal women ranged between 1.6% and 28.1%, 6.1% and 40%, and 10.2% and 94.4%, respectively. As expected, the prevalence of vaginal dryness was consistently higher in postmenopausal women than in premenopausal women

Figure 1. Study Flow Diagram



MEDLINE, international biomedical bibliographic database; EMBASE, international biomedical and pharmacological bibliographic database; PsycINFO: Psychological Information Database; CINAHL, Cumulative Index to Nursing and Allied. Health Literature; Scopus: A multidisciplinary database.

across studies. For the premenopausal women, the prevalence of loss of interest in sex ranged between 30.7% and 31.9%. In perimenopausal women, the range of reported prevalence for low libido and dyspareunia was from 36.8% to 43.1%, and 28.1% to 34.5%, respectively. The range of avoiding intimacy among postmenopausal women was from 81.7 to 93.9%. Use of medications for sexual problems was not specified in most studies. In addition, no study reported distress associated with sexual problems.

In summary, across the published studies, the range of the reported prevalence of sexual symptoms in pre- and perimenopausal women was high. Sexual issues were highly prevalent in postmenopausal women with narrower ranges.

3.5. Risk of Bias

Classification of the overall risk of bias showed that five studies (17, 20-23) presented high risk of bias both for external and internal validity items. These studies used

Table 1. Prevalence of Vasomotor Symptoms in Iranian Middle-Aged Women

Author/Year/City, Risk of Bias Indicator (Item Ranked High[a])	Sampling Method	N	Age Group, Y	Instrument Used/ Validated/ Translated	Distribution of Menopause Status, %	Symptoms (%) in Different Menopause Stages				
						Symptoms	Pre	Peri	Post	Total
Abedzadeh Kalahroudi, 2012; Kashan, [a]1, 6, 10	Cluster, Community	700	40 - 60	MENQOL, V/T	100 post	HF	-	-	80.9	-
						NS	-	-	86 .1	-
						Sweating	-	-	72.3	-
Alizadeh, M. et al. 2014 Tabriz, [a]1, 2, 3, 4	Convenience, Health centres	300	40 - 60	MENQOL, V/T	21.6 Pre, 31.9 Peri, 46.5 Post	HF	31.4	70.0	75.6	54.0
						NS	19.2	39.7	64.0	38.0
						Sweating	27.3	41.4	64.4	43.0
Asadi, 2012; Tehran, [a]1, 2, 3, 7, 9, 10	Convenience, Clinic	134	Not specified	QNV	100 post	HF	-	-	59.5	-
						NS	-	-	38.2	-
Askari, 2011; Gonabad, [a]1, 2, 9	Stratified random sampling, list of PHCC coverage	398	40 - 55	Modified GCS, V/T	37 pre, 37 peri, 26 post	-	-	-	-	-
						HF	33.2	64.0	71.9	52.7
						NS	23.2	51.2	57.9	39.8
Bouzari, 2013; Babol [a]1, 2, 6	Cluster, Community	700	40 - 60	MENQOL, V/T	100 post	HF	-	-	65.8	-
						NS	-	-	74.3	-
						Sweating	-	-	96.0	-
Dawlatian, 2007; Kermanshah [a]1, 2, 7, 9	Random sampling, list of PHCC coverage	460	40 - 60	QNV	28 pre, 39 peri, 33 post	HF	-	-	-	22.6
						NS	2.4	20.3	24.9	17.2
Delavar Aghajani, 2011; Babol [a]1	Cluster, Community	1397	45 - 63	SSC, V/T	47 peri, 53 post	HF	-	39.0	58.4	49.3
Fallahzadeh, 2007; Yazd [a]1, 7, 9	Cluster, Community,	346	40 - 70	QNV	100 post	HF	-	-	73.7	-
Ghazanfarpour, M. et al. 2015; Shiraz [a]1, 3	Convenience Health care centers	349	38 - 78	MENQOL,V/T	100.0 Post	HF	-	-	-	58.9
						NS	-	-	-	56.06
						Sweating	-	-	-	63.3
Shojaeian, 2006; Mashhad , [a]1, 2, 3, 6, 7, 9, 10	Convenience, Clinic	60	45 - 55	QNV	100post	HF	-	-	62.5	-
Soltani, 2001; Ilam , [a]1, 2, 3, 6, 7, 9, 10	Convenience, Clinic	306	Not specified	QNV	100 post	HF	-	-	-	37.3
Tariverdi, 2007; Tabriz , [a]1, 2, 3, 6, 7, 9, 10	Convenience, Clinic	500	Not specified	QNV	100 post	HF	-	-	72.5	-

Abbreviations: GCS, Greene Climacteric Scale; HF, Hot Flashes; MENQOL, Menopause Specific Quality of Life; NS, Night Sweats; NM, Natural Menopause; PHCC, Primary Health Care Centers; QNV, Questionnaire Not Validated; SSC, Symptom Score Card; V/T, Validated/Translated.
[a] Item under the risk-of-bias tool: 1 (national representativeness), 2 (target population representativeness), 3 (random selection or census undertaken), 4 (non-response bias), 6 (acceptable case definition), 7 (valid study instrument), 9 (prevalence period), 10 (appropriateness of numerator and denominator).

non-validated questionnaires and four of them used convenient sampling (17, 21-23). Five studies had moderate risk of bias (8, 15, 18, 19, 24). Only one study had a low risk of bias (16). The items for which there was a high risk of bias are included in the first column of Tables 1 and 2. Greater risk of bias was found in the criteria related to external validity including national representativeness of Iranian middle-aged women (12 studies), sampling system (11 studies), and sample selection method (5 studies), and for internal validity potential areas of bias included definition of menopause, reliability and validity of the instrument used for measuring menopausal symptoms, and length of the shortest prevalence period as well as inappropriateness of numerator and denominator reported in the studies.

4. Discussion

We systematically reviewed previous studies reporting on the prevalence of VMS and sexual symptoms among Iranian women. This review highlights the high prevalence of VMS among Iranian postmenopausal women in both population and clinic-based studies. These findings are in line with findings from Western countries with a high prevalence report for VMS (2, 26-29) and are in contrast with findings from south Asian countries such as Indonesia, Korea, China, Japan and Hong Kong, where there was a lower prevalence of VMS compared to other menopausal symptoms such as physical and psychological symptoms (30). Our findings confirm ethnic variation in reporting VMS by women from different societies (1).

With regards to sexual complains, decreased sexual desire and avoiding intimacy along with vaginal dryness and dyspareunia were also highly reported across studies, particularly among postmenopausal women. Similarly, in one study of 200 middle-aged Muslim women aged 40 to 65 years, decreased or absence of sexual desire was reported by 94.5% of the postmenopausal women (31). A few cases

Table 2. Prevalence of Sexual Symptoms in Iranian Middle-Aged Women

Author/Year/City, Risk of Bias Indicator (Item Ranked High[a])	Sampling Method	Sample Size	Age Group, Y	Instrument Used/Validated/Translated	Distribution of Menopause Status, %	Symptoms (%) In Different Menopause Stages				
						Symptoms	Pre	Peri	Post	Total
Abedzadeh, 2012; Kashan [a] 1, 6, 10	cluster, community	700	40 - 60	MENQOL/V/T	100 post	low libido	-	-	83.7	-
						vaginal dryness	-	-	73.7	-
						avoiding intimacy	-	-	81.7	-
Alizadeh, M. et al. 2014 ; Tabriz, [a] 1, 2, 3, 4	Convenience, PHCC	300	40 - 60	MENQOL, V/T	21.6 Pre, 31.9 Peri, 46.5 Post	low libido	-	-	70.8	47.0
						vaginal dryness	-	-	50.0	37.0
						avoiding intimacy	-	-	53.5	34.0
Asadi, 2012; Tehran, [a] 1, 2, 3, 7, 9, 10	convenience, clinic	134	Not specified	QNV	100 post	vaginal dryness	-	-	41.1	-
						dyspareunia	-	-	9.5	-
Askari, 2011; Gonabad, [a] 1, 2, 9	stratified random sampling, list of PHCC coverage	398	40 - 55	Modified GCS, V/T	37 pre, 37 peri, 26 post	low libido	-	-	30.8	32.1
						vaginal dryness	–	-	37.2	25.6
						dyspareunia	-	-	23.1	21.4
Bouzari, 2013; Babol, [a] 1, 2, 6	cluster, community	700	40 - 60	MENQOL/V/T	100 post	low libido	-	-	92.9	-
						vaginal dryness	-	-	94.4	-
						avoiding intimacy	-	-	93.9	-
Dawlatian, 2005; Kermanshah [a] 1, 2, 7, 9	random sampling, list of PHCC coverage	460	40 - 60	QNV	28 pre, 39 peri, 33 post	vaginal dryness	-	-	10.2	6.3
						-	-	-	-	-
						-	-	-	-	-
Delavar Agajani, 2011; Babol ,[a] 1	cluster, community	1,397	45 - 63	SSC, V/T	47 peri, 53 post	low libido	-	-	47.2	45.3
						vaginal dryness	-	-	33.1	29.2
						dyspareunia	-	-	38.9	36.8
Fallahzadeh, 2007; Yazd ,[a] 1, 7, 9	cluster, community,	346	40 - 70	QNV	100 post	vaginal dryness	-	-	15.3	-
Ghazanfarpour, M. et al. 2015; Shiraz ,[a] 1, 3	Convenience, PHCC	349	38 - 78	MENQOL, V/T	100 post	low libido	-	-	-	58.6
						avoiding intimacy	-	-	-	24.5
						vaginal dryness	-	-	-	22.0
Shojaeian, 2006; Mashhad ,[a] 1, 2, 3, 6, 7, 10	convenience, clinic	60	45 - 55	QNV	100 post	low libido	-	-	64.3	-
						dyspareunia	-	-	32.1	-
Soltani, 2001; Ilam ,[a] 1, 2, 3, 6, 7, 9, 10	convenience, clinic	306	Not specified	QNV	100 post	dyspareunia	-	-	0.9	-
Tariverdi, 2007; Tabriz ,[a] 1, 2, 3, 6, 7, 9, 10	convenience, clinic	500	Not specified	QNV	100 post	low libido	-	-	72.0	-
						dyspareunia	-	-	25.0	-

Abbreviations: GCS, Greene Climacteric Scale; HF, Hot Flashes; MENQOL, Menopause Specific Quality of Life; NM, Natural Menopause; NS, Night Sweats; PHCC, Primary Health Care Centers; QNV, Questionnaire Not Validated; SSC, Symptom Score Card; V/T, Validated/Translated.

[a] Item under the risk-of-bias tool: 1 (national representativeness), 2 (target population representativeness), 3 (random selection or census undertaken), 4 (non-response bias), 6 (acceptable case definition), 7 (valid study instrument), 9 (prevalence period), 10 (appropriateness of numerator and denominator).

were using OCP or MHT in this study, which resulted in exclusion of this study from the review. The treatment status for sexual problems, especially vaginal dryness, was underreported. Receiving treatment might decrease the prevalence of sexual problems. Furthermore, distress of cases regarding sexual difficulties has not been assessed in any of the reviewed studies. Sexual difficulties associated with distress might be lower in Iranian middle-aged women.

In terms of methodology, we observed a considerable methodological variation between studies, regarding their design, sampling method, study population framework, and definition of menopause. Overall, there were a few high quality studies, which included a representative sample. Random sampling of the population was not possible in most studies as the complete list of sampling frame was not available in Iran. Hence, studies usually utilized cluster sampling to obtain a representative sample. In our review, only five studies adopted cluster sampling correctly (8, 14-16, 19). Three studies employed the list of cases covered by their local primary health care centres as sampling framework, which may have not been up to date. Some studies asked cases to visit the PHCC for an interview, for which the refusal rate has not been mentioned. Convenient sampling was used in other studies, which could have created selection bias and affected the study results.

In seven studies with incorrect menopause definition, misclassification of study population might have occurred. Moreover, half of the studies did not use validated instruments for assessing symptoms related to menopause. Symptoms in all studies were reported subjec-

tively and none of the studies used a diary for recording the frequency of hot flashes.

Overall, using the risk of bias tool, 11 studies demonstrated moderate/high risk of bias in both internal validity and external validity.

Our review had a number of strengths and limitations. English and Persian language studies were both included in this review, which limited the potential for publication bias. In the previous review of menopausal symptoms in Asian women (7), only one study from Iran was included, which might have not truly portrayed the symptoms prevalence. A limitation was that we only included studies with reports on the prevalence of menopausal symptoms and studies that reported mean values were excluded although they had used validated questionnaires. The use of MHT or OCP was not specified in some studies included in this review. As a result, their results might have been biased. It should be noted that nine studies exclusively included postmenopausal women, whose menopause was natural and had no co-morbidity. Hence, the results of this review cannot be well extrapolated to unhealthy premenopausal and perimenopausal middle-aged women and also to those with menopause as a result of surgery. Moreover, severity of VMS and sexual issues associated with distress, which are of clinical importance, need further investigation. It is recommended that future studies use objective methods rather than subjective methods to accurately measure the frequency of hot flashes.

4.1. Conclusions

This systematic review was based on studies carried out in Iran and showed VMS and sexual problems in Iran were high, although with a wide range. High risk of bias in the studies might have affected the study results. High quality research is needed to establish the true portray for the prevalence and severity of vasomotor and sexual symptoms associated with distress in Iranian women.

Footnotes

Authors' Contribution: All authors contributed to the design and writing of the manuscript. The early draft of this paper was written by Maryam Masoumi. All other authors critically reviewed and approved the final version of the manuscript.

Conflict of Interest: Authors declare no conflict of interest.

Funding/Support: This study was funded by the Mazandaran University of Medical Sciences, Sari, Iran.

References

1. Freeman EW, Sherif K. Prevalence of hot flushes and night sweats around the world: a systematic review. *Climacteric.* 2007;**10**(3):197–214. doi: 10.1080/13697130601181486. [PubMed: 17487647].
2. Thurston RC, Joffe H. Vasomotor symptoms and menopause: findings from the Study of Women's Health across the Nation. *Obstet Gynecol Clin North Am.* 2011;**38**(3):489–501. doi: 10.1016/j.ogc.2011.05.006. [PubMed: 21961716].
3. Boulet MJ, Oddens BJ, Lehert P, Vemer HM, Visser A. Climacteric and menopause in seven south-east Asian countries. *Maturitas.* 2008;**61**(1-2):34–53. doi: 10.1016/j.maturitas.2008.09.008. [PubMed: 19434878].
4. Avis NE, Stellato R, Crawford S, Bromberger J, Ganz P, Cain V, et al. Is there a menopausal syndrome? Menopausal status and symptoms across racial/ethnic groups. *Soc Sci Med.* 2001;**52**(3):345–56. doi: 10.1016/S0277-9536(00)00147-7. [PubMed: 11330770].
5. Palacios S, Henderson VW, Siseles N, Tan D, Villaseca P. Age of menopause and impact of climacteric symptoms by geographical region. *Climacteric.* 2010;**13**(5):419–28. doi: 10.3109/13697137.2010.507886. [PubMed: 20690868].
6. Melby MK, Anderson D, Sievert LL, Obermeyer CM. Methods used in cross-cultural comparisons of vasomotor symptoms and their determinants. *Maturitas.* 2011;**70**(2):110–9. doi: 10.1016/j.maturitas.2011.07.010. [PubMed: 21871743].
7. Islam MR, Gartoulla P, Bell RJ, Fradkin P, Davis SR. Prevalence of menopausal symptoms in Asian midlife women: a systematic review. *Climacteric.* 2015;**18**(2):157–76. doi: 10.3109/13697137.2014.937689. [PubMed: 24978151].
8. Fallahzadeh H. Age at natural menopause in Yazd, Islamic Republic of Iran. *Menopause.* 2007;**14**(5):900–4. doi: 10.1097/gme.0b013e318032b2e6. [PubMed: 17438516].
9. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JP, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. *BMJ.* 2009;**339**:b2700. doi: 10.1136/bmj.b2700. [PubMed: 19622552].
10. Zollner YF, Acquadro C, Schaefer M. Literature review of instruments to assess health-related quality of life during and after menopause. *Qual Life Res.* 2005;**14**(2):309–27. [PubMed: 15892422].
11. Hoy D, Brooks P, Woolf A, Blyth F, March L, Bain C, et al. Assessing risk of bias in prevalence studies: modification of an existing tool and evidence of interrater agreement. *J Clin Epidemiol.* 2012;**65**(9):934–9. doi: 10.1016/j.jclinepi.2011.11.014. [PubMed: 22742910].
12. Soules MR, Sherman S, Parrott E, Rebar R, Santoro N, Utian W, et al. Executive summary: Stages of Reproductive Aging Workshop (STRAW). *Fertil Steril.* 2001;**76**(5):874–8. doi: 10.1016/S0015-0282(01)02909-0. [PubMed: 11704104].
13. Makvandi S, Zargar Shushtari S, Yazdizadeh H, Zaker Hosseini V, Bastami A. The frequency and severity of menopausal symptoms and its relation with individual factors in pre and post menopausal women in Ahvaz. *J Obstet Gynaecol Infertility.* 2013;**16**(49-50):7–15.
14. Abdi N, Solhi M. Quality of life in postmenopausal women in Tehran. *J Educ Health Promot.* 2014(2):87–96.
15. Abedzadeh-Kalahroudi M, Taebi M, Sadat Z, Saberi F, Karimian Z. Prevalence and severity of menopausal symptoms and related factors among women 40-60 years in Kashan, Iran. *Nursing and Midwifery Studies.* 2012;**1**(2):88–93.
16. Delavar MA, Hajiahmadi M. Age at menopause and measuring symptoms at midlife in a community in Babol, Iran. *Menopause.* 2011;**18**(11):1213–8. doi: 10.1097/gme.0b013e31821a7a3a. [PubMed: 21792079].
17. Asadi M, Jouyandeh Z, Nayebzadeh F. Prevalence of menopause symptoms among Iranian women. *J Fam Reprod Health.* 2012;**6**(1):1–3.
18. Askari F, Basiri MK, Basiri MM, Torabi S, Gholamfarkhani S, Mohareri M, et al. Age of natural menopause and the comparison of incidence of its early complications in menopause transition stages in women from Gonabad city. *J Family Reprod Health.* 2012;**17**(4):42–8.

19. Bouzari Z, Kotenaie MJ, Darzi AA, Hajian K. Menopausal symptoms can be influenced by various sociodemographic factors and quality of life (qol) decreases after the menopause. *World Appl Sci J.* 2013;**23**(9):1221–30.
20. Dawlatian M, Bakhteh A, Vellaii N, Afshar F. Prevalence of menopausal related depression and its relative factors. 2006 ;**10**:76–89.
21. Tariverdi M, Shabani A. Assessment of psychological problems in postmenopausal women and its relationship with individual and social characteristics and menopausal symptoms referred to Tabriz University of Medical Sciences' hospitals in 2005-2006. *J Urmia Nurs Midwifery Fac.* 2007;**5**(1):1–7.
22. Shojaeian Z, Abedian Z, Mokhber N, Mazloom SA. Assessment of the relationship between menopausal symptoms and severity of depression in postmenopausal women. *Iran J Obstet Gynecol Infertil.* 2007;**9**(2):85–92.
23. Soltani O. Menopausal prevalence and related factors among women referred to Mostafa Khomeini hospital of Ilam, in 2001. *J Ilam Univ Med Sci.* 2003;**10**(36-37):44–9.
24. Ghazanfarpour M, Kaviani M, Abdolahian S, Bonakchi H, Najmabadi Khadijeh M, Naghavi M, et al. The relationship between women's attitude towards menopause and menopausal symptoms among postmenopausal women. *Gynecol Endocrinol.* 2015;**31**(11):860–5. doi: 10.3109/09513590.2015.1056138. [PubMed: 26425992].
25. Alizadeh M, Sayyah-Melli M, Ebrahimi H, Shishavan MK, Rahmani F. Social determinants and reproductive factors of the menopausal symptoms among women in tabriz-iran. *SDOH.* 2015;**1**(1):2–8.
26. Dibonaventura MD, Chandran A, Hsu MA, Bushmakin A. Burden of vasomotor symptoms in France, Germany, Italy, Spain, and the United Kingdom. *Int J Womens Health.* 2013;**5**:261–9. doi: 10.2147/IJWH.S39027. [PubMed: 23737678].
27. Worsley R, Bell RJ, Gartoulla P, Davis SR. Low use of effective and safe therapies for moderate to severe menopausal symptoms: a cross-sectional community study of Australian women. *Menopause.* 2016;**23**(1):11–7. doi: 10.1097/GME.0000000000000495. [PubMed: 26240945].
28. Gartoulla P, Islam MR, Bell RJ, Davis SR. Prevalence of menopausal symptoms in Australian women at midlife: a systematic review. *Climacteric.* 2014;**17**(5):529–39. doi: 10.3109/13697137.2013.865721. [PubMed: 24245562].
29. Gartoulla P, Worsley R, Bell RJ, Davis SR. Moderate to severe vasomotor and sexual symptoms remain problematic for women aged 60 to 65 years. *Menopause.* 2015;**22**(7):694–701. doi: 10.1097/GME.0000000000000383. [PubMed: 25706184].
30. Haines CJ, Xing SM, Park KH, Holinka CF, Ausmanas MK. Prevalence of menopausal symptoms in different ethnic groups of Asian women and responsiveness to therapy with three doses of conjugated estrogens/medroxyprogesterone acetate: the Pan-Asia Menopause (PAM) study. *Maturitas.* 2005;**52**(3-4):264–76. doi: 10.1016/j.maturitas.2005.03.012. [PubMed: 15921865].
31. Merghati-Khoei E, Sheikhan F, Shamsalizadeh N, Haghani H, Yousofnia Pasha YR, Killeen T. Menopause negatively impacts sexual lives of middle-aged Iranian women: a cross-sectional study. *J Sex Marital Ther.* 2014;**40**(6):552–60. doi: 10.1080/0092623X.2013.796577. [PubMed: 24308863].