Original Article

The Role of Lifestyle in Developing and Maintaining Vasomotor Symptoms: A Cross-Sectional Study among Iranian Postmenopausal Women

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ABSTRACT

Objective: Lifestyle patterns are not only related to healthy life but also could be related to modifying menopausal symptoms. Considering the lack of data, the present study aimed to evaluate the relationship between lifestyle and vasomotor symptoms among Iranian postmenopausal women. **Materials and Methods:** The present cross-sectional questionnaire-based study was conducted among 302 eligible postmenopausal women referring to Shahroud health centers (Shahroud, Iran) during June 2017 and October 2018. The Iranian standard questionnaire on women health project (Saba questionnaire) was used for data collection. Our data were analyzed using the SPSS software (version 18). Descriptive statistics, Chi-square test, Fisher's exact test, and multiple logistic regression were used to address sociodemographic characteristics among our participants and the relations between lifestyle and vasomotor symptoms. **Results:** We found a significant relation between daily dairy units ($P = 0.05$), daily vegetable units ($P = 0.01$), weekly use of solid oils (0.01), and hot flush. The relation between daily vegetable units and urinary incontinence was also statistically significant ($P = 0.02$). When we use multiple logistic regression, we found significant predictive relations between daily vegetable unit status ($P = 0.01$), weekly use of solid oils ($P = 0.04$), body mass index ($P = 0.03$), and hot flush. **Conclusion:** The study provided findings to support the probable relation between some of lifestyle-related variables and vasomotor symptoms in postmenopausal women.

KEYWORDS: *Climacteric, hot flashes, lifestyle, menopause, urinary incontinence*

INTRODUCTION

Menopause is a normal physiologic period and also an important stage of an individual's life. It is not only related to the end of reproductive cycles but also confronts women with a variation of vasomotor, physical, and sexual problems. The age at initiation of menopause has been estimated between 44.6 and 52 years, but it could vary worldwide.[1] Iranian women often experience natural menopause between the ages of 48.66 and 50.4 in different regions.[2]

Hormonal replacement therapy is a well-known treatment for vasomotor symptoms. It also confronts women with various advantages and disadvantages which impact on women's decision-making. Hence, most of them decide to adopt themselves with this condition.[3] Vasomotor and other menopausal symptoms cause considerable impact on health-related quality of life among this population.[4]

Moreover, women who experience menopause at earlier ages are predisposed to develop cardiovascular diseases.

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Furthermore, current evidence support the relationship between coronary heart disease, heart failure, stroke, and natural menopause in younger ages.[3] The impact of menopause as a risk factor in presenting life-threatening diseases,[3] highlights the importance of considering preventive strategies in this population; therefore, it is critical to monitor lifestyle pattern among this population to prevent menopausal symptoms as well as further physical problems.[5] Previous studies showed controversies regarding the relation between lifestyle and vasomotor symptoms that emerge the need for further observations.[6]

Given the lack of adequate data on the relation between lifestyle and menopausal vasomotor symptoms, the present study was conducted to demonstrate an overview on postmenopausal women lifestyle in Iran and also the relations between lifestyle and menopausal symptoms among this population. We hypothesized that monitoring lifestyle could be an effective method in modifying menopausal symptoms.

MATERIALS AND METHODS

The present cross-sectional study was conducted between June 2017 and October 2018. The study protocol was in compliance with the Declaration of Helsinki and ethical considerations of ethics committee of Shahroud University of Medical Sciences and this committee approved the study protocol (approval No: IR.SHMU. REC.1395.154). All postmenopausal women referring to Shahroud health centers were invited to participate in the study after receiving adequate information on the study aims. Included participants aged 40–55, had no hormone replacement therapy during the past 6 months, and no history of oophorectomy. They all had their last menstruation within 3 years ago. As hot flashes often stop occurring after a year or 2 years of menstrual interruption.[7]

Shahroud city has 10 urban health centers and among them, we selected three referral centers including: Azima health center, 12th Farvardin health center, and Mahdi Abad health center. Our reason for selecting these centers was the considerable number of clients in these centers in Shahroud.

Considering the total population of menopause women in Shahroud, Iran (n = 15782) and the prevalence of menopausal symptoms (75%),[7] our sample size was calculated as 283 women using OpenEpi software (version 3.0, open-source calculator, SSPropor, www.OpenEpi.com). As hot flashes often stop occurring after a year or 2 years of menstrual interruption,[7] all participants had their last menstruation within 3 years ago. Volunteer women who met following inclusion criteria: women aged 40–55 years, no history of oophorectomy, and the absence of hormone replacement therapy during 6 months before the study participation enrolled in the study and provided written informed consent. Totally, 302 postmenopausal women participated in the study based on convenience sampling method (138 participants were selected from Azima health center, 99 women were selected from 12th Farvardin health center, and 65 eligible postmenopausal women were selected from Mahdi Abad health center). We used the standard questionnaire on women health project (Saba questionnaire) which was developed and approved by the Iran Ministry of Health and was commonly used in health centers to address women characteristics in three different sections: first section included questions on sociodemographic characteristics (age, education, occupation, body mass index (BMI), number of children, and date of last menstrual period), second part was related to data on women life-style during the last year and contained three subsection on nutrition (specific diet, food groups serving per day and food habits); physical activity (including type and duration of activities per day and per week) and tobacco use, and finally, the third section was providing the data on menopause variables and symptoms (date of menopause, menarche age, age at the time of first delivery, number of pregnancy, number of delivery, hot flush, night sweat, vaginal dryness, and urinary incontinence). Completing the questionnaire took an average of 12 min and participants did not receive any incentives for participation. The Statistical package for the social sciences version 18.0 (SPSS Inc, Chicago, IL, USA) was used for data analysis. We used descriptive statistics as well as Chi-square test, Fisher's exact test, and multiple logistic regression to categorize sociodemographic characteristics and the relations between lifestyle of participants and vasomotor symptoms.

RESULTS

Totally, 371 women were invited to participate in the study and 28 women were not volunteered and 41 women were not eligible; finally, 302 menopaused women completed participation. The mean and standard deviation of age in our study was 49.74 ± 3.88 years and mean age of menopause among our participants was 48.76 ± 3.87. The majority of women (44.7%) had elementary education and the most prevalent menopausal symptom in our study was hot flush (55.60%). Other sociodemographic and menopausal symptoms are addressed in Table 1. Among sociodemographic variables, we found significant relationship between marital status and urinary incontinence (P = 0.05), BMI and hot flush (P = 0.04), age and vaginal

Table 1: Sociodemographic characteristics and menopause symptoms of participants

	n (%)
Age (years)	
40-44	43 (14.24)
45-49	78 (25.83)
50-55	181 (59.93)
Total	302 (100.00)
Education	
Illiterate	18 (5.96)
Elementary	135 (44.70)
Guidance school	49 (16.23)
High school	64 (21.19)
Diploma or academic education	36 (11.92)
Total	302 (100.00)
Occupation	
Housewife	265 (87.75)
Clerk	5 (1.65)
Retired	24 (7.95)
Other	8 (2.65)
Total	302 (100.00)
Marital status	
Single	4 (1.32)
Married	263 (87.09)
Widowed	32 (10.6)
Divorced	3 (0.99)
Total	302 (100.00)
BMI (kg/m²)	
≤25	251 (83.11)
>25	51 (16.88)
Total	302 (100.00)
Number of pregnancy	
0	11 (3.64)
1-2	66 (21.85)
3-4	128 (42.38)
5-6	67 (22.18)
≥7	30 (9.93)
Total	302 (100.00)
Number of delivery; mean±SD	3.46±1.81
Age at the time of first delivery	
<20	121 (40.06)
20-24	134 (44.37)
25-29	29 (9.60)
≥30	18 (5.96)
Total	302 (100.00)
Number of children	
0	11 (3.64)
1-2	84 (27.81)
3-4	136 (45.03)
5-6	55 (18.21)
7-8	16 (5.29)
Total	302 (100.00)
Date of last menstrual period	
1 year ago	94 (31.12)

Contd...

Table 1: Contd...

	n (%)
2 years ago	116 (38.41)
3 years ago	92 (30.46)
Total	302 (100.00)
Menopause age (years)	
40-44	43 (14.24)
45-49	110 (36.42)
50-55	149 (49.34)
Total	302 (100.00)
Menarche age (years)	
<12	23 (7.60)
12-13	147 (48.70)
14-15	95 (31.50)
≥16	24 (7.90)
Total	289 (95.70)
Hot flush	
Yes	168 (55.60)
No	134 (44.40)
Night sweat	
Yes	94 (31.10)
No	208 (68.90)
Vaginal dryness	
Yes	96 (31.80)
No	206 (68.20)
Urine incontinence	
Yes	87 (28.80)
No	215 (71.20)

BMI: Body mass index

dryness ($P = 0.04$) as well as menopausal age and vaginal dryness ($P = 0.04$).

We also assessed daily and weekly nutritional habits among our participants, as well as physical activities and tobacco or alcohol consumption. The majority of our participants reported weekly use of solid oils (65.20%). In addition to the type of physical activities, we also addressed severity, days of activity per week, daily and weekly duration of activities among our participants and based on these characteristics, we categorized our participants into two groups who had satisfactory or unsatisfactory physical activity. Most of the participants who had weekly regular walking, reported mild severity (35.90%), and mean weekly duration of 170.92 ± 99.60 min. Among participants who reported working as physical activity, 42 participants (63.60%) had mild activity and mean duration of 828.68 ± 637.30 min/week. Among women who report exercise as physical activity 13 participants (36.10%) had moderate severity of exercise and mean weekly duration of 344.80 ± 478.13 min. None of participants reported alcohol or amphetamine consumption. Other factors relating lifestyle are summarized in Table 2.

Table 2: Lifestyle of participants (diet, physical activities, and tobacco/alcohol consumption)	
	n (%)
Specific diet	
Yes	73 (24.20)
No	229 (75.80)
Total	302 (100.00)
Daily dairy units status	
Satisfactory	173 (57.28)
Unsatisfactory	129 (42.72)
Total	302 (100.00)
Daily vegetable units status	
Satisfactory	159 (52.64)
Unsatisfactory	143 (47.36)
Total	302 (100.00)
Daily fruit units status	
Satisfactory	254 (84.10)
Unsatisfactory	48 (15.90)
Total	302 (100.00)
Weekly use of fast foods	
No	293 (97.00)
Yes	9 (3.00)
Total	302 (100.00)
Weekly use of carbonated drinks	
No	267 (88.40)
Yes	35 (11.60)
Total	302 (100.00)
Weekly use of Solid oils	
No	105 (34.80)
Yes	197 (65.20)
Total	302 (100.00)
Physical activity	
No	82 (27.20)
Yes	220 (72.80)
Total	302 (100.00)
Type of physical activity	
Walking	168 (55.63)
Working	62 (20.53)
Exercise	19 (6.29)
Walking and working	19 (6.29)
Walking an exercise	25 (8.28)
Working and exercise	6 (1.98)
Walking, working, and exercise	3 (0.99)
Total	302 (100.00)
Walking status	
Satisfactory	73 (23.21)
Unsatisfactory	142 (76.78)
Total	215 (100.00)
Working status	
Satisfactory	11 (12.22)
Unsatisfactory	79 (87.77)
Total	90 (100.00)
Exercise status	
Satisfactory	42 (79.24)
Unsatisfactory	11 (20.75)

Contd...

Table 2: Contd...	
	n (%)
Total	53 (100.00)
Tobacco use	
No	1 (0.30)
Yes	301 (99.70)
Total	302 (100.00)
Indirect tobacco usage	
No	22 (7.30)
Yes	280 (92.70)
Total	302 (100.00)
Sedatives or sleep aids consumption	
Yes	8 (2.60)
No	294 (97.40)
Total	302 (100.00)

Chi-square and Fisher's exact test evaluated the relationship between lifestyle and vasomotor symptom among postmenopausal women in our study. Our findings demonstrated a significant relation between daily dairy units status and hot flush ($P = 0.05$). Chi-square test results also produced a significant relation between daily vegetable units and hot flush ($P = 0.01$). Women who had regular weekly use of solid oils were more likely to suffer from menopausal hot flush ($P = 0.01$). Our findings also showed statistically significant ($P = 0.02$) relation between daily vegetable units status and urinary incontinence [Table 3].

We also used multiple logistic regression and the following variables entered the model: daily dairy unit status, daily vegetable units' status, weekly use of solid oils, and BMI. We found significant predictive relations between daily vegetable units status ($P = 0.01$), weekly use of solid oils ($P = 0.04$), BMI ($P = 0.03$), and hot flush.

DISCUSSION AND CONCLUSION

The present study designed to demonstrate lifestyle patterns and vasomotor symptoms among Iranian postmenopausal women, as well as the relation between these variables. We found hot flush as the most common symptom among our population that was significantly related to daily dairy and vegetable units, as well as weekly use of solid oils.

Previous studies also mentioned hot flush as the most prevalent and distressing menopausal symptom[8,9] which is consistent with our findings. Hot flush is not a life-threatening symptom during menopausal period and therefore has not received adequate attention in previous studies. Estrogen withdrawal is the main physiologic cause of hot flushes. The hot flush episodes could be induced by a variety of triggers

Table 3: The relation between lifestyle and vasomotor symptoms

	Hot flush		P	Night sweat		P
	Yes	No		Yes	No	
Daily dairy units status						
Satisfactory	86 (52.40)	82 (63.60)	0.05[a]	50 (53.80)	118 (59.00)	0.39[a]
Unsatisfactory	78 (47.60)	47 (36.40)		43 (46.20)	82 (41.00)	
Daily vegetable units status						
Satisfactory	75 (46.00)	79 (60.80)	0.01[a]	50 (53.80)	104 (52.00)	0.77[a]
Unsatisfactory	88 (54.00)	51 (39.20)		43 (46.20)	96 (48.00)	
Daily fruit units status						
Satisfactory	133 (81.60)	111 (86.70)	0.23[a]	79 (84.90)	165 (83.30)	0.72[a]
Unsatisfactory	30 (18.40)	17 (13.30)		14 (15.10)	33 (16.70)	
Weekly use of fast foods						
Yes	5 (3.00)	3 (2.20)	0.73[b]	3 (3.20)	5 (2.40)	0.70[b]
No	162 (97.00)	131 (97.80)		91 (96.80)	202 (97.60)	
Weekly use of carbonated drinks						
Yes	21 (12.70)	14 (10.40)	0.54[a]	14 (15.20)	21 (10.10)	0.20[a]
No	114 (87.30)	120 (89.60)		78 (84.80)	186 (89.90)	
Weekly use of solid oils						
Yes	119 (71.70)	78 (58.60)	0.01[a]	65 (69.90)	132 (64.10)	0.32[a]
No	47 (28.30)	55 (41.40)		28 (30.10)	74 (35.90)	
Physical activity						
Yes	126 (75.00)	94 (70.10)	0.34[a]	70 (74.50)	150 (72.10)	0.67[a]
No	42 (25.00)	40 (29.90)		24 (25.50)	58 (27.90)	
Walking status						
Satisfactory	16 (27.10)	19 (33.90)	0.42[a]	8 (25.80)	27 (32.10)	0.51[a]
Unsatisfactory	43 (72.90)	37 (66.10)		23 (74.20)	57 (67.90)	
Working status						
Satisfactory	6 (17.60)	3 (16.70)	>0.99[b]	2 (13.30)	7 (18.90)	>0.99[b]
Unsatisfactory	28 (82.40)	15 (83.30)		13 (86.70)	30 (81.10)	
Exercise status						
Satisfactory	9 (69.20)	3 (50.00)	0.61[b]	6 (66.70)	6 (60.00)	>0.99 [b]
Unsatisfactory	4 (30.80)	3 (50.00)		3 (33.30)	4 (40.00)	
Tobacco use						
Yes	0 (0.00)	1 (0.70)	0.44[b]	0 (0.00)	1 (0.50)	>0.99[b]
No	168 (100.00)	133 (99.30)		94 (100.00)	207 (99.50)	
Sedatives or sleep aids use						
Yes	5 (3.00)	3 (2.20)	>0.99[b]	3 (3.20)	5 (2.40)	0.70[b]
No	163 (97.00)	131 (97.80)		91 (96.80)	203 (97.60)	
Vaginal dryness and urinary incontinence						
	Vaginal dryness		P	Urinary incontinence		P
	Yes	No		Yes	No	
Daily dairy units status						
Satisfactory	56 (58.30)	112 (56.90)	0.81[a]	49 (57.00)	119 (57.50)	0.93[a]
Unsatisfactory	40 (41.70)	85 (43.10)		37 (43.00)	88 (42.50)	
Daily vegetable units status						
Satisfactory	47 (49.50)	107 (54.00)	0.46[a]	37 (42.50)	117 (56.80)	0.02[a]
Unsatisfactory	48 (50.50)	91 (46.00)		50 (57.50)	89 (43.20)	
Daily fruit units status						
Satisfactory	74 (78.70)	170 (86.30)	0.12[a]	70 (81.40)	174 (84.90)	0.46[a]
Unsatisfactory	20 (21.30)	27 (13.70)		16 (18.60)	31 (15.10)	
Weekly use of fast foods						
Yes	2 (2.10)	6 (2.90)	>0.99[b]	0 (0.00)	8 (3.70)	0.11[b]
No	94 (97.90)	199 (97.10)		87 (100.00)	206 (96.30)	
Weekly use of carbonated drinks						

Contd...

Table 3: Contd...

	Hot flush		*P*	Night sweat		*P*
	Yes	No		Yes	No	
Yes	14 (14.90)	21 (10.20)	0.24[a]	13 (15.30)	22 (10.30)	0.22[a]
No	80 (85.10)	184 (89.80)		72 (84.70)	192 (89.70)	
Weekly use of solid oils						
Yes	64 (67.40)	133 (65.20)	0.79[a]	61 (70.90)	136 (63.80)	0.24[a]
No	31 (32.60)	71 (34.80)		25 (29.10)	77 (36.20)	
Physical activity						
Yes	67 (69.80)	153 (74.30)	0.41[a]	62 (71.30)	158 (73.50)	0.69[a]
No	29 (30.20)	53 (25.70)		25 (28.70)	57 (26.50)	
Walking status						
Satisfactory	11 (32.40)	24 (29.60)	0.77[a]	10 (29.40)	25 (30.90)	0.87[a]
Unsatisfactory	23 (67.60)	57 (70.40)		24 (70.60)	56 (69.10)	
Working status						
Satisfactory	4 (28.60)	5 (13.20)	0.22[b]	3 (20.00)	6 (16.20)	0.70[b]
Unsatisfactory	10 (71.40)	33 (86.80)		12 (80.00)	31 (83.80)	
Exercise status						
Satisfactory	4 (66.70)	8 (61.50)	>0.99[b]	1 (25.00)	11 (73.30)	0.11[b]
Unsatisfactory	2 (33.30)	5 (38.50)		3 (75.00)	4 (26.70)	
Tobacco use						
Yes	0 (0.00)	1 (0.50)	>0.99[b]	1 (1.10)	0 (0.00)	0.28[b]
No	96 (100.00)	205 (99.50)		86 (98.90)	215 (100.00)	
Sedatives or sleep aids use						
Yes	3 (3.10)	5 (2.40)	0.71[b]	4 (4.60)	4 (1.90)	0.23[b]
No	93 (96.90)	201 (97.60)		83 (95.40)	211 (98.10)	

[a]Chi-square test, [b]Fisher's exact test

such as stressful situations, changes in temperature and smoking as well as alcohol, caffeine or warm drinks consumption.[10] Although the prevalence of tobacco use or alcohol consumption among women is increasing,[11] many Iranian women avoid substance or alcohol use due to cultural context, legal prohibition, alcohol use-related stigma and religious beliefs,[12] which could be an important indicator in reducing hot flush episodes. Our findings also demonstrated no history of alcohol or amphetamine consumption among our participants.

Regular exercise could be another important factor for preventing development of hot flushes or night sweat episodes. Regular aerobic exercises have been suggested as the most effective approach to control hot flush episodes.[13,14] Walking was the most prevalent physical activity among our participants, but most of our participants had unsatisfactory walking status considering severity of walking, weekly episodes of walking and weekly duration of this activity. Unsatisfactory status of walking among our study population was the probable reason for insignificant relation between walking as physical activity and hot flushes episodes. Functional disabilities and chronic pain in postmenopausal women could be another major reason for avoiding physical activities in this population. Furthermore, due to the

lack of estrogen, osteoporosis is a prevalent finding in menopausal women, which is related to chronic pain and higher incidence of bone fracture. Although physical activities are recommended for preventing the progress of osteoporosis, many menopausal women avoid physical activities due to preventing bone damages and the risk of fractures.[15,16]

Obesity and overweight are prevalent in postmenopausal women. They are also probable risk factors for presenting hot flushes.[13] Previous studies on the relation between BMI and hot flushes episodes are controversial.[17] In our setting, we found a statistically significant relation between BMI and hot flush. Furthermore, weekly use of solid oils was significantly higher among postmenopausal women with hot flush experiences, which was probably due to cultural beliefs and attitudes regarding benefits of solid oils consumption among this population in our country or higher prevalence of using solid oils among overweight people.

One prospective cohort study on 10,787 postmenopausal women showed a significant relationship between night sweat and increased risk of coronary heart diseases.[18] Although our research was not designed to address this possible relationship, the total prevalence of night sweat in our population was more than other studies[19,20] that

might be attributed to the factors influencing presence of vasomotor symptoms such as climate situation, lifestyle patterns, and the way of confronting with the end of reproductive life among women.[21] The prevalence of night sweat in our participants was closer to the percentages reported in Iranian studies.[22,23]

One of the limitations in our study was related to not using biochemical tests to confirm menopause, and hence, menopausal age was self-reported in our study. Furthermore, we did not address the status of using nonprescription remedies by our participants (such as vitamin E, herbal, and complementary medicine supplements and methods); hence, the impact of these remedies has not been proven in previous clinical trials.[13]

Lifestyle patterns and balanced nutritional diet have been noted effective in minimizing menopausal symptoms,[24] but this relationship has received little attention in previous studies investigating postmenopausal life in Iran. The study provided an overview on components relating lifestyle among Iranian postmenopausal women which was missing in previous studies, we also addressed the relationship between lifestyle-related variables and menopausal symptoms among postmenopausal women as well as valuable guidance for further investigations in this population. We showed significant relation between daily dairy and vegetable units and hot flush, as the most prevalent menopausal symptom. Although dietary supplements are not commonly used by menopausal women for controlling menopausal symptoms, especially among low socioeconomic populations, we recommend further clinical trials to address the impacts of dietary supplements on pre- and postmenopausal symptoms.

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Conflicts of interest

There are no conflicts of interest.

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