Association between Lifestyle and Severity of Menopausal Symptoms in Postmenopausal Women

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Citation: Yoshany N, Mazloomy Mahmoodabad SS, Bahri N, Moori MK, Hanna F. Association between Lifestyle and Severity of Menopausal Symptoms in Postmenopausal Women. Electron J Gen Med. 2020;17(5):em222. https://doi.org/10.29333/ejgm/7885

ARTICLE INFO
Received: 17 Jan. 2020
Accepted: 5 Feb. 2020

ABSTRACT
Objective: Menopause is a physiological occurrence characterized by a series of bothersome symptoms. Given that lifestyle affects people’s health in general and many menopausal symptoms are influenced by changes in lifestyle, this study aimed to determine the relationship between lifestyle and severity of menopausal symptoms in women referred to health centers in Yazd city.

Method: This cross-sectional study was performed using stratified random sampling where 343 postmenopausal women who had experienced natural menopause for 1-5 years, and did not have any chronic or debilitating disease were selected. The study was conducted in 2017 in Yazd city, Iran. The data collection tools were Walker’s Health Promoting Lifestyle Profile II (HPLP2) and Menopause Rating Scale (MRS) questionnaires. A multiple hierarchical linear regression was used to investigate the association between lifestyle and severity of menopausal symptoms.

Results: The total mean ± (SD) score of menopausal symptoms severity and women’s lifestyle were 10.21 ± 6.55 and 126.44 ± 79.27, respectively. The results of multiple hierarchical linear regression showed a significantly negative association between lifestyle score and the mean score of menopausal symptoms severity in all three models (P-value <0.001).

Conclusion: Our study concluded that healthier lifestyle reduces the severity of menopausal symptoms. These findings warrant that policy makers in the design of postmenopausal care plans and programs ought to pay special attention to the role of healthy lifestyles, including physical activity and healthy diet in enhancing menopausal symptoms. By preventing aggravation of menopausal symptoms; it is possible to economize on referrals to physicians and medicinal and therapeutic costs. Longitudinal and intervention studies with larger sample size may be required to confirm these findings.

Keywords: menopausal symptoms, postmenopausal, severity, life style

INTRODUCTION
Menopause is a physiological phenomenon that is caused by the pause of the activity of the ovaries followed by complete menstrual cessation, as defined by the World Health Organization (1). Although menopause is considered a physiological phenomenon, due to the severity of symptoms and the global trend of aging populations, women’s health at the age of menopause is very important (2,3). According to the Iranian Statistics Center in 2011, there were 10.74% women aged 40-60 years old in Iran (4). Although menopause is a natural physiological manifestation that affect all women, in some cases the severity of the symptoms can affect the person’s daily activities and communications (5-7). A study by Olanjbo and colleagues on postmenopausal women found that menopausal symptoms had a negative effect on occupational responsibilities (8). Several factors affect the severity and manifestation of menopausal symptoms, including inappropriate diet, stress and lack of physical activity (9,10). Today, in order to minimize the problems of menopause, various strategies such as regular physical activity programs and proper diet are recommended (11).

Lifestyle is a part of life that is actually being realized and encompasses a full range of activities that people do in daily life. Healthy lifestyle includes proper nutrition, physical activity, avoiding drug use, protection against accidents, timely diagnosis of disease symptoms in the physical dimension, emotional control, and adaptation to the
environment (12). Nowadays, it is believed that 70% of the
diseases are associated with the individual’s lifestyle (13). In
many studies, the role of lifestyle in modifying of symptoms
and disease progression has been proven. For example
Ghezelbash et al., in a comprehensive literature review; found
that people with high blood pressure could greatly control their
disease through lifestyle changes (14). Another study by Babaei
et al. concluded that educational intervention was effective in
promoting physical activity, improving weight control and
nutrition, and improving mental health in patients with
hypertension (15). Furthermore, Ghorbani et al. found, in their
study, that healthy lifestyle reduces vasomotor symptoms in
postmenopausal women (16) while a study on 400
postmenopausal women showed Healthy lifestyle improves
quality of sleep in postmenopausal women (17). The study by
Tartibian that looked at the role of physical activity revealed
that regular aerobic exercise program reduces serum FSH
levels in postmenopausal women and vasomotor symptoms
(18). Moreover, Blümel et al. reported high prevalence of
sedentary lifestyle in a sample of middle-aged Latin American
women that was associated with more severe menopausal
symptoms and obesity (19). Limited studies (19,20) have
examined the severity of all menopausal symptoms and their
relationship with lifestyle; therefore, the present study was
directed to investigate the relationship between lifestyle
practices and severity of menopausal symptoms in
postmenopausal women in Iran.

MATERIALS AND METHODS

This study was cross-sectional in design. Sample size was
calculated using related studies in the field (16, 17).
Considering the error level of 0.05% and the power of 80%
and according to the correlation coefficient of 0.158 reported
from the relationship between lifestyle and menopausal
complications, the sample size required for the present study
was 312 with a final number of 343 subjects when considering
an extra 10% to allow for dropout. The inclusion criteria
included: passing at least 1 year and maximum 5 years of
menopause, no early menopause, minimum level of education
at junior-high school level, absence of a chronic and/or
debilitative disease, Iranian nationality, having no history of
hysterectomy and oophorectomy, willingness to participate in
the study, absence of unpleasant and stressful incidents in the
last 6 months, and no particular diet plan or regular drug use.

The demographic data were collected using a demographic
checklist including 10 questions about age, education, income,
occupation, duration of menopause, housing status, number of
children, age of marriage, number of pregnancies, and age at
menopause. The Walker’s Health Promoting Lifestyle Profile II
(HPLP2) questionnaire used in this study consisted of 52
questions including 6 components. The scoring of the HPLP2
questionnaire is based on a 4-point scale; each score is as
follows: never: 1, sometimes: 2; often: 3; normally: 4; adding up
to a highest score of 208 and lowest score of 52. Lin et al.,
showed that Cronbach’s α for this questionnaire was 0.96 and
that for each subscale ranged from .77 to .87. Also, its reliability
and validity on Iranian women has been published previously
(21). Menopause severity was assessed by the Menopause
Rating Scale (MRS) questionnaire. The MRS evaluate 11
menopausal symptoms including: hot flushes and sweating,
heart discomfort, sleep problems, depressive mood, irritability,
anger, physical and mental exhaustion, sexual
problems, bladder problems, vaginal dryness and joint and
muscular discomfort. These questions were measured based
on a 5-point Likert scale. The lower the overall score of the MRS,
the lower the severity of the experienced symptoms. The
validity and reliability of this international tool for measuring
the severity of menopausal symptoms has been confirmed in
previous clinical and epidemiological study (17).

The data were analyzed using Statistical Package for the
Social Sciences (SPSS) software version 18. The descriptive
analyses means (standard deviations) for continuous and
number (percent) for categorical variables were used to assess
the data. In bivariate analysis; Pearson correlation coefficient,
t-test and one-way ANOVA were applied to specify the
association of the studied variables with MRS.

Three hierarchical multiple linear regression models were
conducted to examine adjusted association of lifestyle and
MRS. Based on relevant literature and using p-value cut-off
point of < 0.02, the variables were entered into the regression
models. In the univariate model lifestyle was entered
(unadjusted model). In the multivariate model, variables such
as age, job, and ownership of house, education level, and
income were also entered. In the third model, in addition to the
variables entered in previous model, the variables of
menopausal duration, marriage age, menopause age, number
of deliveries, and the number of children entered the model.
The P value of less than 0.05 was considered significant.

The research protocol was approved by the Research Ethics
Committee of Shahid Sadoughi University of Medical Sciences
(code: IR.SSU.SPH.REC.1396.162 dated 17/2/2018). In addition,
after explaining the research purposes to the menopausal
women in person, a written informed consent was obtained to
ensure confidentiality of information and voluntarily
participation. The questionnaire was completed by the
researcher.

RESULTS

The mean ± (SD) age of women in this study was 48.75 ±
(SD = 1.7) year with 46.2% of women had level of education
below a diploma, 56.7% were housewives, and 40.1% had a
monthly income level of 4 Million or more. Subject’s
demographic characteristics are reported in Table 1.

The mean score of menopausal symptoms severity was
10.21 (SD = 6.50) while the mean score of the subjects’ lifestyle
was 126.44 (SD = 27.8) (Table 1).

The results of Pearson correlation test showed a significant
relationship between severity of menopause symptoms and
lifestyle score, number of deliveries, marriage age, number of
children, and menopause age (P < 0.001). The results of one-way
ANOVA showed a statistically significant difference between
the mean score of menopausal symptoms severity in different
levels of education and income (P < 0.001) (Table 2).

The results of hierarchical multiple linear regression models
showed (crude and adjusted models) a negative
significant relationship between lifestyle and severity of
menopause symptoms (Table 3).
Table 1. Distribution of Socio-demographic Variables of the Participant (n=312)

| Variables                        | Categories             | Mean (SD) or n (%) |
|----------------------------------|------------------------|--------------------|
| Age                              |                        | 48.75 (1.7)        |
| Number of children               |                        | 3.31 (1.3)         |
| Menopause age                    |                        | 46.39 (1.47)       |
| Number of deliveries             |                        | 3.54 (1.5)         |
| Marriage age                     |                        | 19.91 (4.0)        |
| Total mean score of the severity |                        | 126.44 (27.8)      |
| of menopausal symptoms           |                        | 10.21 (6.6)        |

| Variables                        | Categories             | Mean (SD) or n (%) |
|----------------------------------|------------------------|--------------------|
| Education level                  | Under diploma          | 144 (46.2%)        |
|                                  | Associate degree       | 28 (9.0%)          |
|                                  | Bachelor’s degree      | 82 (26.3%)         |
|                                  | Masters’ degree        | 36 (11.5%)         |
|                                  | PhD degree             | 22 (7.1%)          |
| Occupation                       | Housewife              | 177 (56.7%)        |
|                                  | Employee               | 135 (43.3%)        |
| Household income level           | Under 100$ (<1 million Tomans*) | 5 (1.6%) |
|                                  | Between 100-200$ (1-2 million Tomans*) | 16 (5.1%) |
|                                  | Between 200-300$ (2-3 million Tomans*) | 65 (20.8%) |
|                                  | Between 300-400$ (3-4 million Tomans*) | 101 (32.4%) |
|                                  | More than 400$ (>4 million Tomans*) | 125 (40.1%) |
| Menopause duration               | 1 year                 | 110 (35.3%)        |
|                                  | 2 years                | 82 (26.3%)         |
|                                  | 3 years                | 52 (16.7%)         |
|                                  | 4 years                | 42 (13.5%)         |
|                                  | 5 years                | 26 (8.4%)          |
| Housing                          | Owner                  | 263 (84.3%)        |
|                                  | Rented                 | 49 (15.7%)         |

*Million Tomans is the Iranian currency

Table 2. The Bivariate Analysis of Independent Variables, Lifestyle and Menopause Severity (N=312)

| Independent variable | Categories                          | Type of test | Pearson Correlation | P-value |
|----------------------|-------------------------------------|--------------|---------------------|---------|
| Age                  | -                                   | Correlation  | -.107               | .06     |
| Menopause duration   | -                                   | Correlation  | -.116               | P<0.001 |
| Menopause age        | -                                   | Correlation  | -.207               | P<0.01  |
| Number of deliveries | -                                   | Correlation  | -.501               | P<0.001 |
| Marriage age         | -                                   | Correlation  | .684                | P<0.001 |
| Number of children   | -                                   | Correlation  | -.516               | P<0.001 |
| Life Style           | -                                   | Correlation  | -.781               | P<0.001 |

| Education level      | Under diploma                      | ANOVA        | -                   | P<0.001 |
|                      | Associate degree                   |              |                     |         |
|                      | Bachelor’s degree                  |              |                     |         |
|                      | Masters’ degree                    |              |                     |         |
|                      | PhD degree                         |              |                     |         |
| Job                  | Housewife                          | T-test       | -                   | P<0.001 |
|                      | Employee                           |              |                     |         |
| Ownership of house   | Personal                            | T-test       | -                   | P<0.05  |
|                      | Rented                             |              |                     |         |

| Income               | Between 100-200$ (1-2 million Tomans*) | ANOVA        | -                   | P<0.001 |
|                      | Between 200-300$ (2-3 million)        |              |                     |         |
|                      | Between 300-400$ (3-4 million)        |              |                     |         |
|                      | More than 400$ (>4 million)           |              |                     |         |
|                      | Between 100-200$ (1-2 million Tomans*) |              |                     |         |
DISCUSSION

Our study found a significant relationship between lifestyle factors and the severity of menopausal symptoms; where those with a healthier lifestyle had less severity of menopausal symptoms. This finding contradicts findings by Guimaraz et al. (2010) that physical activity had no significant effect on menopausal symptoms (22). In a study by Bahriand colleagues (2013), there was no significant relationship between the severity of menopausal symptoms with anxiety and depression (23), which is also inconsistent with the results of the present study, possibly due to the difference in the measurement scale of menopausal symptoms. On the other hand, a study by Lopez et al. (2011) showed a significant relationship between lifestyle dimensions, physical activity, interpersonal relationships and spiritual growth with the number and severity of hot flashes and the number and severity of nightly sweating (24), which is partly in line with the results of our study. Furthermore, an earlier work by Ivarsson et al. (1998) found that by increasing physical activity, the severity of hot flashes reduced (25).

In the present study, there was a significant relationship between type of housing, occupation, age of marriage, menopausal age and menopausal duration and the severity of menopausal symptoms. In the study of Chedraui et al. age, menopause age, sexual inactivity and educational level were found to be independent risk factors predicting more severe menopausal symptoms. Women with lower educational level presented higher somatic and psychological scorings in comparison to their counterparts (5). Gold et al. in a cross-sectional study found age to be significantly associated with vasomotor symptoms, although a dose-response relation with hours of smoke exposure was not observed. No dietary nutrients were significantly associated with vasomotor symptoms (26). In the study of Ghorbani (16), a significant relationship between the number of pregnancies and the number of children and the severity and duration of hot flashes was found, which was not consistent with the results of the present study. The results of this study showed that, the longer the age of menopause the more severe the symptoms of menopause. Moreover, we found the severity of menopausal symptoms to be positively associated with the number of deliveries and the number of children. In the present study, there was a significant reverse relationship between the marriage age and the severity of menopausal symptoms; where those who had a higher marriage age reported less severity of menopausal symptoms. This could be due to the fact that those who are married at an early age are more likely to be involved in life events and have more life-threatening conditions that can increase the severity of menopausal symptoms. Furthermore, in the present study, the severity of menopausal symptoms varied in different levels of education. Those with higher levels of education had less severity of menopausal symptoms. Gold et al. (2004) also found a significant relationship between the individuals’ level of education and the severity of hot flashes and nightly sweating (26), which is consistent with the results of the present study. Moreover, the study of Ayati et al. indicated that within creating the level of education, fewer individuals experienced hot flashes (27), which is also in line with our findings. This could be explained by the fact that those with higher levels of education have better awareness and subsequently better strategies to cope with menopausal symptoms, and, they are more likely to be health conscious and therefore seek health

Table 3. The Results of hierarchical multiple regression Models

| Independent variables | Model 1 | Model 2 | Model 3 |
|-----------------------|---------|---------|---------|
|                       | Coefficients (SE) | Beta (Standardized Coefficients) | P-value | Coefficients (SE) | Beta (Standardized Coefficients) | P-value | Coefficients (SE) | Beta (Standardized Coefficients) | P-value |
| Lifestyle score       | -2.184 (-0.08) | -0.781 | -0.001 | -1.52 (-0.012 | -0.647 | -0.001 | -1.67 (-0.011 | -0.788 | -0.001 |
| Age                   | -0.311 | 0.123 | 0.086 | -0.007 | 1.397 | 1.696 | 0.361 | 1.411 |
| Job                   | -1.190 | 0.926 | 0.090 | -0.199 | 0.486 | 0.867 | 0.037 | 0.576 |
| Ownership of house    | -1.374 | 0.510 | 0.076 | -0.007 | 0.966 | 0.474 | 0.054 | 0.043 |
| Income level          |         |         |       |       |       |       |       |       |
| Between 100-2005 (1-2 millionTons) |          |         |       |       |       |       |       |       |
| Between 200-3005 (2-3 million) |          |         |       |       |       |       |       |       |
| Between 300-4005 (3-4 million) |          |         |       |       |       |       |       |       |
| More than 4005 (>4 million) |          |         |       |       |       |       |       |       |
| Education Level       |         |         |       |       |       |       |       |       |
| Under diploma         | -2.908 | 0.673 | 0.127 | -0.000 | -3.058 | 0.611 | 0.134 | 0.000 |
| Bachelor’s degree     | -2.265 | 1.074 | 0.152 | 0.036 | -1.817 | 1.006 | 0.122 | 0.072 |
| Masters’ degree       | -3.571 | 1.243 | 0.174 | 0.004 | -3.940 | 1.184 | 0.192 | 0.001 |
| PhD degree            | -2.371 | 1.281 | 0.093 | 0.065 | -1.731 | 1.276 | 0.068 | 0.176 |
| Menopause duration    |         |         |       |       |       |       |       |       |
| Menopause age         |         |         |       |       |       |       |       |       |
| Delivery              |         |         |       |       |       |       |       |       |
| Marriage age          |         |         |       |       |       |       |       |       |
| Number of children    |         |         |       |       |       |       |       |       |
| N                    | 312     | 312     | 312    | 312    | 312    | 312    | 312    | 312    |
In the present study, there was a significant inverse relationship between the healthy lifestyle and menopause duration.

CONCLUSIONS

Our cross-sectional analysis revealed a significant relationship between severity of menopausal symptoms and lifestyle factors. This is a significant public health issue and should be considered in the design of healthcare programs and plans to prevent and reduce menopausal symptoms and reduce and alleviate the burden associated with the inevitable menopause. Basic lifestyle modification, including regular physical activity, having healthy nutrition and avoiding tobacco smoking may play an important role in reducing the severity of menopausal symptoms. Policy makers and health professionals should pay special attention to promote the healthy lifestyle in developing preventive and care programs for postmenopausal women. Longitudinal studies are required to confirm these cross-sectional findings.

ACKNOWLEDGEMENTS

Hereby, we gratefully thank the menopause women who helped us conduct this work, also social determinants of health research center for financial support of the project, and the deputy of health and the staff of the health centers who helped the researchers in conducting this project.

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