Exploring the relationship between menopausal symptoms, personality, and depressive symptoms in postmenopausal women

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Abstract

Background A quick look at the results of research studies in the existing literature indicates that depression in postmenopausal women can greatly affect their function and self-esteem. The aim of the present study was to explore the potential relationships between menopausal symptoms, sleep quality, hot flash, and depressive symptoms in postmenopausal women.

Methods A cross-sectional study was designed with 150 healthy postmenopausal women (45–60 years of age) who had referred to the menopausal clinic in Babol. The participants completed the following instruments throughout the study: the Beck Depression Inventory for depressive symptoms, the Modified Blatt-Kupperman Menopausal Index for measuring menopausal symptoms, and the NEO-FFI for identifying the personality traits.

Results After controlling all the covariates, high depressive symptoms were found to be associated with moderate/ sever menopausal symptoms, poor sleep quality, and the average and high level of neuroticism. The results also demonstrated that the risk of depressive symptoms was lower in menopausal women with high level extroversion, high level agreeableness, and the average and high level of conscientiousness.

Conclusions The findings of the present study indicated that personality traits, menopausal symptoms, and poor sleep quality in particular can partially account for depression in Iranian menopausal women.

Background

Menopause is a normal event experienced in every woman's life [1]. It is widely accepted that it occurs to women around 40–58 years of age all over the globe [2, 3]. Research findings illustrate that Iranian women generally reach menopause around 48 years of age [4] and commonly experience many different symptoms such as vasomotor, psychological, and somatic symptoms, which could be due to the sudden decline of estrogen level [5–8]. It is generally assumed that the severity and frequency of menopausal symptoms could be different for each woman [9]. Survey results indicate that psychological disorders such as depression, anxiety, and difficulties in coping with stress are more prevalent around the age of menopause menopausal women [10, 11]. The mean age for the prevalence of depression is supposedly 40, and it is most likely to occur around the age of menopause [12, 13]. It is evident that depression could have adverse effects on interpersonal relationships, social, occupational, and sexual function of women; thus, it, according to research findings, could have serious consequences for 34% of postmenopausal women [14, 15].

It is also presumed that personality traits could tremendously affect the severity of the menopausal symptoms [16]. Given that the relationship between personality traits and the severity of menopausal symptoms is somehow vague, several studies have already tried to explore and substantiate this relationship [17, 18]. It is widely thought that personality traits can reflect the cognition, emotions, and the behavioral tendencies of individuals in various circumstances. Although there are numerous personality

traits, only a few of them have been investigated by scholars during menopause with regard to depression [19, 20]. For instance, the results of a study conducted by Sassoon et al. demonstrated that individuals with personality disorders were more likely to have shown episodes of menopausal symptoms and depression [21].

There are, nevertheless, many reports with contradictory results about the relationship between menopausal symptoms and depression. Despite the positive interest, it can be postulated that the role of personality traits and menopausal symptoms in the development of depression is poorly understood and inadequately researched in Iranian context. Hence, in the light of these concerns, it is imperative that both personality and menopausal symptoms, especially poor sleep and hot flash factors leading to the development of depression symptoms, be investigated for women around menopause women. Such results, if achieved, could help prevent and manage depression by providing the necessary interventions and guidelines.

Methods

This study adopted a cross-sectional descriptive design to collect information exploring the potential relationships between menopausal symptoms, sleep quality, hot flash, and depressive symptoms in postmenopausal women. This research was additionally approved by the ethics committee of Babol University of Medical Sciences (Ethic ID: IR. MUBABOL.HRI.REC. 1397. 032). The inclusion criteria for the study were as follows: The participants had to be around 45-60 years of age, and they had to have experienced their last menstruation at least one year prior to the study. It is also worth noting that women with a history of surgical menopause, abnormal cervical smear test, chronic diseases, endometrial or ovarian cancer or breast cancer, thyroid dysfunction, anti-psychotic drug use, hormone replacement therapy during the last six months, and smoking habits or alcohol use were excluded from the study. Any interested menopausal women around 45-60 years of age who referred to the menopausal clinic affiliated with Babol University of Medical Sciences over the period between September 2016 and August 2018 were recruited for this study. We totally recruited 189 women (age range 45–60) for this study, out of whom 31 were excluded, and 158 proved to be eligible for the purpose of this study. Before the outset of the research, informed written consents were obtained from all the participants. Then the participants were asked to complete the questionnaires for the study. Eight questionnaires were excluded due to missing information, and the remaining data from the 150 women were used for the final analysis.

The instruments for this study were: The traits data; the Beck Depression Inventory (BDI), used for assessing depressive symptoms [22]; Modified Blatt-Kupperman Menopausal Index (MKMI), measuring the severity of climacteric symptoms [23]; and Five Factor Inventory (NEO-FFI), used for the assessment of personality traits [24].

The participants' age, education, marital status, parity, working status, monthly family income, and cigarette use were obtained from the questionnaire. The participants' weight was measured using digital scales with minimal dress and without shoes. The height was recorded with a tape. The BMI was

computed using the formula weight (kg)/height2 (m). The waist circumference was measured to the nearest 1 centimeter using a tape measure at the level midway between the lower rib margin and iliac crest.

Beck Depression Inventory (BDI): BDI is a standard tool, widely used in numerous studies measuring physical, behavioral, and cognitive symptoms of depression. This questionnaire comprises 13 items, each substance has 4 options, scaling down from 0 to 3, and it sets various degrees of depression from mild to severe. The maximum score in this test is 63, and the minimum is zero [22]. The reliability and validity of this questionnaire was reported by a study conducted by Rajabi. The questionnaire had been used to screen depression in psychiatric outpatients in Iran [25].

NEO Five-Factor Inventory (NEO-FFI): The NEO-FFI is one of the most widely used instruments to assess personality traits on five dimensions: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness through 60 questions. NEO-FFI is scored based on a 5-point Likert's scale (strongly disagree, disagree, no idea, agree, and strongly agree) , and the questions are scored from 0 to 5. It is worth mentioning that reverse-coding needs to be considered for some questions [24]. The reliability of the NEO-FFI had already been confirmed by Garousi et al. in Iran. They reported Cronbach alpha coefficients of 0.86, 0.73, 0.56, 0.68, and 0.87 for neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness, respectively [26].

Modified Blatt- Kupperman Menopausal Index (MKMI): The Climacteric symptoms were assessed through the 13-item MKMI. It should be mentioned that urinary infection was added to the modified version, and libido was reduced from the original KI. It comprises the following 13 components: hot flash and night sweats, paresthesia, insomnia, nervousness, melancholia, vertigo, fatigue, arthralgia, myalgia, headache, heart palpitation, formication, sexual complaints, and urinary tract infection. Each symptom on the MKMI was rated from 0 to 3 for no, slight, moderate, and severe complaints. To calculate the MKMI, the weighted score for hot flashes/sweating was 4 points; paresthesia, insomnia, mood swings, sexual problems, and urinary tract infection were 2 points each; and the other symptoms were 1 point each. The total scores ranged from 0 to 63. Scores ranging from 0–6, 7–15, 16–30, and 30 were used to rate the degree of severity as none, mild, moderate, and severe, respectively [23]. The validity of MKMI had already been confirmed by Mohammadi et al., in Iran [27].

Statistical analyses

The data were analyzed using statistical package of computer software (SPSS) 20.0. Chi-square test was used to examine the characteristics of the participants: women without depression and those with depression. Logistic regressions were run to assess the relationships between variables, related to depressive symptoms at p = 0.2 in the bivariate analyses. Odds ratios associated with 95% confidence intervals (CIs) were computed using logistic regression. The p-value of 0.05 or less was considered significant in all tests.

Results

A total of 150 post-menopausal women (with a mean age of 54.1 ± 3.6 years, ranging 45–60 years of age) were enrolled. Moderate/ sever menopausal symptoms were observed in 72.0% of the participants. The prevalence of hot flash and poor sleep were 72.7% and 24.0%, respectively. According to NEO-FFI, high levels of neuroticism were observed in 30.7% of the participants. The prevalence of low levels of extroversion, openness to experience, agreeableness, and conscientiousness were 21.3%, 74.0%, 41.7%, and 7.3%, respectively. The overall prevalence depressive symptoms in menopausal women (45–60 years of age) were 53.3%, measured by the Beck Depression Inventory. The participants were divided into two groups in terms of traits: depressed and non-depressed. The participants with depressive symptom were more likely to rate lower education status ($p = 0.025$) and their monthly family income was low ($p = 0.007$). There were no statistically significant differences found between the age, marital status, parity, working status, BMI, waist circumference or cigarette use of women with and without depressive symptoms (Table 1).

Table 1
Characteristics of the participants by depression symptom

Variables	Depressed (n = 80)		Non-depressed (n = 70)		*p*-Value
	N	%	N	%	
Age (years)					
45–54	37	46.8	42	53.2	0.092
55–60	43	60.6	28	39.4	
Education (years)					
< 12	69	58.0	50	42.0	0.025
≥ 12	11	35.5	20	64.5	
Marital status					
Being married	73	52.5	66	47.5	0.477
Being single	7	63.6	4	36.4	
Parity					
0–1	7	53.8	6	46.2	0.940
2–4	54	52.4	49	47.6	
> 5	19	55.9	15	44.1	
Working status					
Yes	10	58.8	7	41.2	0.630
No	70	52.6	63	47.4	
Monthly family income (Rails*)					
< 2,000,000	55	62.5	33	37.5	0.007
≥ 2,000,000	25	40.3	37	59.7	
Body mass index (kg/m^2)					
< 25	21	63.6	12	36.4	0.179
≥ 25	59	50.4	58	49.6	
Waist circumference (cm)					

* 1000 Rial = 0.02 US Dollar

**Menopausal symptoms – Modified Kupperman Menopausal Index

Variables	Depressed (n = 80)		Non-depressed (n = 70)		*p*-Value
	N	%	N	%	
< 88	22	57.9	16	42.1	0.514
≥ 88	58	51.8	54	48.2	
Cigarette use					
Current	6	54.5	5	45.5	0.503
Former	4	36.4	7	63.6	
never	70	54.7	58	45.3	
Neuroticism					
Low	9	24.3	28	75.7	0.000
Average	37	55.2	30	44.8	
High	34	73.9	12	26.1	
Extroversion					
Low	27	84.4	5	15.6	0.000
Average	20	60.6	13	39.4	
High	33	38.8	52	61.2	
Openness to experience					
Low	58	52.3	53	47.7	0.625
Average	17	60.7	11	39.3	
High	5	45.5	6	54.5	
Agreeableness					
Low	27	73.0	10	27.0	0.012
Average	26	53.1	23	46.9	
High	27	42.2	37	57.8	
Conscientiousness					
Low	10	90.9	1	9.1	0.000
Average	32	74.4	11	25.6	

* 1000 Rial = 0.02 US Dollar

**Menopausal symptoms – Modified Kupperman Menopausal Index

Variables	Depressed (n = 80)		Non-depressed (n = 70)		*p*-Value
	N	%	N	%	
High	38	39.6	58	60.4	
Menopausal symptoms **					
No complain/ mild (0–15)	14	33.3	28	66.7	0.002
Moderate/ sever (> 15)	66	61.1	42	38.9	
Hot flash					
Yes	62	56.9	47	43.1	0.156
No	18	43.9	23	56.1	
Sleep					
Poor sleep	27	75.0	9	25.0	0.003
No problem	53	46.5	61	53.5	
* 1000 Rial = 0.02 US Dollar					
**Menopausal symptoms – Modified Kupperman Menopausal Index					

Table 2 presents the estimated adjusted and unadjusted odd ratios (with 95% CI), depressive symptoms associated with menopausal symptoms, and personality. After controlling the covariates (age, education, BMI, and monthly family income), the adjusted ORs for the depressive symptom were as follows: moderate/sever menopausal symptoms (OR = 3.52; 95% CI = 1.57, 7.89), poor sleep (OR = 4.65; 95% CI = 1.82, 11.88), average neuroticism trait (OR = 2.48; 95% CI = 1.06, 5.81), high neuroticism trait (OR = 9.03; 95% CI = 3.16, 25.75), high extroversion trait (OR = 0.13; 95% CI = 0.05, 0.39), high agreeableness trait (OR = 0.31; 95% CI = 0.13, 0.78), average conscientiousness trait (OR = 0.25; 95% CI = 0.11, 0.58), and high conscientiousness trait (OR = 0.09; 95% CI = 0.01, 0.73). All these obtained results were significantly associated with depressed menopausal women. No significant associations were found between depressive symptoms, hot flash, the average level of extroversion, or the average level of agreeableness.

Table 2
Unadjusted and adjusted for the association of depression symptoms with personality, menopausal symptom

Variables	Unadjusted OR (95% CI)	Adjusted OR (95% CI)**
Menopausal symptoms **		
No complain/ mild (0–15)	1.00 (reference)	1.00 (reference)
Moderate/ sever (> 15)	3.14 (1.49, 6.65)*	3.52 (1.57, 7.89)*
Hot flash		
No	1.00 (reference)	1.00 (reference)
Yes	1.69 (0.82, 3.48)	1.77 (0.82, 3.82)
Sleep		
No problem	1.00 (reference)	1.00 (reference)
Poor sleep	3.45 (1.49, 7.99)*	4.65 (1.82, 11.88)*
Neuroticism		
Low	1.00 (reference)	1.00 (reference)
Average	2.30 (1.02, 5.19)*	2.48 (1.06, 5.81)*
High	8.82 (3.25, 23.93)*	9.03 (3.16, 25.75)*
Extroversion		
Low	1.00 (reference)	1.00 (reference)
Average	0.41(0.18, 0.94)*	0.50 (0.21, 1.18)
High	0.12 (0.41, 0.34)*	0.13 (0.05, 0.39)*
Agreeableness		
Low	1.00 (reference)	1.00 (reference)
Average	0.65(0.31, 1.37)	0.68 (0.31, 1.48)
High	0.27 (0.11, 0.65)*	0.31 (0.13, 0.78)*
Conscientiousness		
Low	1.00 (reference)	1.00 (reference)

* P < 0.05

**Adjusted for age, education, body mass index, and monthly family income

***Menopausal symptoms – Modified Kupperman Menopausal Index

Variables	Unadjusted OR (95% CI)	Adjusted OR (95% CI)**
Average	0.23 (0.10, 0.50)*	0.25 (0.11, 0.58)*
High	0.07 (0.01, 0.53)*	0.09 (0.01, 0.73)*
* P < 0.05		
**Adjusted for age, education, body mass index, and monthly family income		
***Menopausal symptoms – Modified Kupperman Menopausal Index		

Discussion

The findings of this study demonstrated that depressive symptoms in postmenopausal women were associated with the severity of menopause, even after controlling the covariate variables. This finding is consistent with those of other studies reporting that depressive symptoms positively correlated with severity of menopausal symptoms [28, 29]. We also found that poor sleep was associated with depressive symptoms in postmenopausal women. This finding is also in line with those of several other studies substantiating the association between poor sleep and depressive symptoms [30–33]. Nonetheless, contrary to other studies, we found that having hot flash was not associated with depressive symptoms [30, 32, 34]. This discrepancy in result could be attributed to the different age of the participants in our study.

Moderate/severe hot flashes are usually observed for four to five years after the menopause [35]. 45.3% of the participants in our study, however, reported that the final menstrual period occurred to them in the last 5 years or longer. In addition, our finding is congruous with studies reporting no association between depressive symptoms and hot flashes [12, 36].

It is imperative to figure out as to whether personality trait could predict depression in postmenopausal women. Among personality traits, neuroticism is supposedly a vital trait which could predict the severity of menopausal symptoms (33). Our finding depicted that women with average and high neuroticism traits could be more vulnerable to depressive symptoms. This finding is consistent with the result of a community study conducted by Chou et al. on 190 middle-aged women and demonstrated the positive correlation between neuroticism and depressive symptoms [12]. A possible explanation for the causal relationship between neuroticism and the severity of depression is that neuroticism can lead to irrational thinking in postmenopausal women, which may amplify negative attitudes toward the body and encourage them to seek an indication of illness [37]. Moreover, it is worth mentioning that neuroticism can substantially strengthen the response to internal and external anxieties [35]. It can consequently engender negative attitudes due to natural changes occurring during the menopause, which can ultimately lead to an increased risk of depression [16].

Furthermore, our findings depicted that other personality traits such as high level extroversion, high level agreeableness, and the average and high level of conscientiousness tend to lower the depressive

symptoms in menopausal women. Numerous research studies have already confirmed the relationship between personality traits and depressive symptoms [38–40]; there are several studies, however, failing to support this relationship [41–43]. They, as a matter of fact, reported that changes in depressive symptoms were not necessarily related to those of the personality traits [44, 45].

As for the limitations, this study had several limitations: first, this study used a self-report questionnaire to determine the symptoms of menopause, personality traits, and depression, which may have induced some kind of response bias. Other limitations of the study were the small sample size as well as access to participants.

Despite the limitations, the study had a number of strengths. It enjoyed a community-based design and made use of wide inclusion and exclusion criteria to screen the participants. The study covered the mid-life age group only (45–60 years) and used valid instruments to assess menopausal symptoms. The most noticeable merit of the study was the recruitment of healthy women and the exclusion of those with chorionic diseases.

Conclusion

The results of this study indicated that depression was associated with menopausal symptoms, poor sleep, and personality traits in Iranian menopausal women. The study also depicted that neuroticism could serve as a predictor of depression in menopausal women. Hence, it can be concluded that the use of screening for the identification of the personality traits could greatly contribute to hinder depression. It is highly imperative that the staff at menopausal clinics pay adequate heed to menopausal women with sever menopausal symptoms, poor sleep, or neuroticism and implement appropriate strategies to improve the quality of life for these women.

Abbreviations

BDI: Beck Depression Inventory; MKMI: Modified Blatt-Kupperman Menopausal Index; NEO-FFI: NEO Five-Factor Inventory

Declarations

Ethics approval and consent to participate

This research was additionally approved by the ethics committee of Babol University of Medical Sciences (Ethic ID: IR. MUBABOL.HRI.REC. 1397. 032). Participants in this Study provided written informed consent.

Consent for publication

Not applicable.

Availability of data and material

The datasets used during this study are available from the corresponding author on reasonable request.

Competing interests

There is no conflict of interest between the authors

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Authors' contributions

NH, MAD, and SE conceived the research idea and designed the Proposal. SM, SE, and NA collected data. NA and MAD analyzed the data. NA, MAD, SE, and MAD wrote the manuscript. All authors have seen and approved the final version of the manuscript.

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