Factors associated with dysfunction in menopausal women in Truong An ward, Hue city

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Abstract

Background: The study aimed to identify factors affecting dysfunction in the climacteric women. **Materials and Methods:** A cross-sectional descriptive study was carried out in 410 menopausal women in Truong An ward, Hue City. The degree of functional disorders in menopause was measured by Menopause Rating Scale (MRS). Yin deficiency and Yang deficiency constitutions were determined by Body Constitution Questionnaire. **Results:** The average scores of each sub-scale and total MRS scale were 3.05 ± 1.93, 4.70 ± 2.63, 3.12 ± 1.88, and 10.88 ± 5.72, respectively. Yin deficiency constitution accounted for 69.3% and Yang deficiency constitution 50.7%. The risk factors including: smoking with psychological (OR=9.75; 95% CI: 2.42-39.30; p<0.05); physical activity with urogenital (OR = 3.34; 95% CI: 1.42-7.85; p<0.05); parity with psychological (OR=1.45; 95% CI: 1.02-2.06; p<0.05); Yin deficiency constitution with psychological (OR=1.10; 95% CI: 1.06-1.13; p<0.001), somatovegetative (OR=1.23; 95% CI: 1.18-1.28; p<0.001), urogenital (OR=1.23; 95% CI: 1.15-1.32; p<0.001), and total scale (OR=1.31; 95% CI: 1.23-1.39; p<0.001); Yang deficiency constitution with psychological (OR=1.11; 95% CI: 1.08–1.14; p<0.001), somatovegetative (OR=1.09; 95% CI: 1.05–1.13; p<0.001), urogenital (OR=1.09; 95% CI: 1.03–1.15; p<0.05), and total scale (OR=1.17; 95% CI: 1.10–1.24; p<0.001). **Conclusions:** Smoking, physical activity, parity, Yin deficiency and Yang deficiency were factors associated with dysfunction in menopausal women.

Key words: *menopause, yin deficiency, yang deficiency, menopause rating scale, body constitution questionnaire.*

1. INTRODUCTION

Menopause is a state of permanent absence of menstruation due to decreased ovarian function, leading to temporary changes and disorders of some physiological and psychological functions [1]. In developed countries, the mean age of menopause is between 51 and 52 years old but can also occur between 40 and 60 years old. In Vietnam, the average age of menopause ranges from 48 to 50 [2, 3]. Demographic data have shown that every year approximately 25 million women worldwide experience the climacteric and that by 2030 there will be approximately 1.2 billion postmenopausal women. It is estimated that about 85% of women have at least one of the symptoms of menopause, but only 10% of them need to seek health care methods during this period [4].

According to Traditional Medicine (TM), menopause is a specific period for women, caused by Kidney-qi deficiency, the Chong and Ren meridians being out of balance causing menstrual bleeding to be interrupted, the body not being able to adapt causing yin and yang to become imbalanced. However, due to the different characteristics of each body, the yin or yang may be defective, so the clinical manifestations of functional impairment during menopause are not the same [5]. Researching the factors that impact these disorders, including the constitution types of yin deficiency and yang deficiency, will make an important contribution to developing individualized treatment plans. Therefore, the study aimed to survey dysfunction according to Menopause Rating Scale (MRS) and identify factors affecting these disorders in menopausal women.

2. MATERIALS AND METHODS

2.1. Study population

The study was conducted in women aged 40 years and above, living in Truong An Ward, Hue City. Inclusion criteria included women with natural menopause, no return of menstruation after 1 year, and agreed to participate. Subjects who had malignant diseases, use hormone replacement therapy, unable to communicate and answer the questions were excluded.

2.2. Study method

2.2.1. Study design: A cross-sectional descriptive

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study was conducted from 04/2021 to 06/2022 in Truong An Ward, Hue City.

2.2.2. Sample size: The sample size was calculated according to the formula for estimating mean in the community:

$$n = \frac{Z^2_{1-\frac{\alpha}{2}} \times \sigma^2}{d^2}$$

With α=0.05, Z=1.96, d=0.75, σ=5.79 (standard deviation of mean score of MRS according to research by Hoang Thi Lien et al) [6]. Adjusted for dropout rate of 10% and design effect of 1.5, the minimum sample size was 382 participants.

Participants were recruited based on a multi-stage cluster sampling technique. In the first stage, four civil groups were randomly selected among 11 civil groups in Truong An ward, then the research team contacted the Women's Union to obtain a list of women aged 40 and above. In the second stage, we used the question: "In the past year, have you had your period?" to screen and list menopausal women. Then, based on the sampling criteria, we randomly selected women to include in the study. The final sample was 410 participants.

2.2.3. Variables and measurements

Dependent variable: The level of dysfunction in the climacteric women was measured by MRS. This scale was classified into three sub-scales: psychological (4 items) - depressive mood, irritability, anxiety and exhaustion; somatovegetative (4 items) - sweating or hot flushes, heart discomfort, sleep problems, joint and muscle discomfort; urogenital (3 items) - sexual problems, bladder problems and vaginal dryness. The sensitivity was 70.8% and specificity 73.5%; the intraclass correlation coefficient (ICC) ranged from 0.83 to 0.93; values of Cronbach's α for psychological, somatovegetative, and urogenital were 0.88, 0.68, and 0.59, respectively.

Each items was scored on a Likert scale ranging from 0 to 4 (0, no complaints; 1, mild; 2, moderate; 3, severe; 4, very severe) [7, 8]. Participants reported symptoms according to the MRS as experienced in the previous two weeks. A total MRS score was calculated as the sum of all the sub-scale. The severity of symptoms was divided into four levels corresponding to each domain: psychological included none (0-1 point), mild (2-3 points), moderate (4-6 points), and severe (≥7 points); somatovegetative included none (0-2 points), mild (3-4 points), moderate (5-7 points), and severe (≥8 points); urogenital included none (0 point), mild (1 point), moderate (2-3 points), and severe (≥4 points); total scale included none (0-4 points), mild (5-8 points), moderate (9-15 points), and severe (≥16 points) [6].

Independent variables: Demographic characteristics included age, occupation status, and marital status. Reproductive factors included number of years of menopause (under 5 years, between 5 and 10 years and over 10 years), hot flushes (under 3 times/day and 3 times/day or above), parity. Lifestyle factors included smoking, alcohol, and physical activity. Body Constitution Questionnaire (BCQ) was used to survey two constitution types including Yin deficiency (BCQ−, 19 items) and Yang deficiency (BCQ+, 19 items). Sensitivity and specificity were 70.4% and 61.9% for Yin deficiency, 78.7% and 65.3% for Yang deficiency, respectively. The Cronbach's α for BCQ− and BCQ+ were 0.85 and 0.88, respectively, and ICC were greater than 0.7 for most items. Each item was calculated on a 5-points Likert scale (1, never; 2, occasional; 3, half; 4, often; 5, always). The diagnostic cut-off points of BCQ– and BCQ+ were 29.5 and 30.5, respectively [9, 10]. Participants reported the problems as experienced in the previous month based on the BCQ– and BCQ+.

2.2.4. Data collection

The data collection toolkit was designed based on variables. Field interviewers were trained to clearly understand the toolkit, approach and interview subjects. We conducted a pilot survey on a group of 30 menopausal women to test the semantics and appropriateness of the Vietnamese version of the toolkit, then revised and conducted a final study. Research subjects were interviewed directly at their households.

2.5. Statistical analysis

The data were imported and analyzed by SPSS 20.0 software. Continuous variables were presented by mean and standard deviation (SD), characteristics of categorical variables were described by frequencies and percentages. Comparison of differences between the mean values was ascertained by One-way ANOVA (normal distribution) and Kruskal-Wallis test (non-normal distribution), and Post Hoc test was used to accurately determine the pair of values with the difference. Multivariable logistic regression models were used to analyze risk factors for menopausal women. Odds ratios (ORs) and 95% confidence intervals (CI) were obtained, statistical significance level was determined when $p<0.05$.

2.6. Ethics statement

The research was approved by the Ethics Council in Biomedical Research of the University of Medicine and Pharmacy, Hue University (No. H2021/217). The collected information was kept confidential and used only for research purposes.

3. RESULTS

Table 1. Baseline characteristics of participants

Variable (n = 410)		Frequency (n)	Percentage (%)
Age, years	< 60	289	70.5
	≥ 60	121	29.5
	Mean ± SD	56.50 ± 5.04	
Occupation	White-collar worker	89	21,7
	Blue-collar worker	174	42.4
	Retired	139	33.9
	Disablement	8	2.0
Marital status	Married	375	91.5
	Widowed/Divorced/Separated	32	7.8
	Single	3	0.7
Number of years of menopause, years	< 5	174	42.4
	5 - 10	163	39.8
	> 10	73	17.8
Number of hot flushes, times/day	≥ 3	128	31.2
	< 3	282	68.8

The mean age was 56.50 ± 5.04 and most of the participants were married (91.5%). The group with menopause less than 5 years had the highest proportion (42.4%). The number of hot flushes less than 3 times/day accounted for 68.8%.

Table 2. The degree of dysfunction in menopausal women

Menopause Rating Scale (n = 410)		Frequency (n)	Percentage (%)
Psychological score	None	96	23.4
	Mild	130	31.7
	Moderate	175	42.7
	Severe	9	2.2
	Mean ± SD	3.05 ± 1.93	
Somatovegetative score	None	96	23.4
	Mild	47	11.5
	Moderate	229	55.9
	Severe	38	9.3
	Mean ± SD	4.70 ± 2.63	
Urogenital score	None	55	13.4
	Mild	17	4.1
	Moderate	171	41.7
	Severe	167	40.7
	Mean ± SD	3.12 ± 1.88	
Total score	None	87	21.2
	Mild	25	6.1
	Moderate	220	53.7
	Severe	78	19.0
	Mean ± SD	10.88 ± 5.72	

The moderate level group accounted for a higher proportion than the other level groups in all three sub-scales and total scale (42.7%, 55.9%, 41.7% và 53.7%, respectively). The average scores of each sub-scale and total scale were 3.05 ± 1.93, 4.70 ± 2.63, 3.12 ± 1.88, and 10.88 ± 5.72, respectively.

Table 3. Differences in scores of Menopause Rating Scale among the groups

Menopause Rating Scale	Number of years of menopause			p
	< 5 years[a]	5-10 years[b]	> 10 years[c]	
MRS individual items				
Sweating/hot flushes, mean rank	271.76	178.40	108.09	p_{a-b}<0.001 p_{a-c}<0.001 p_{b-c}<0.001
Heart discomfort, mean (SD)	0.84 (0.46)	0.82 (0.57)	0.75 (0.70)	>0.05
Sleep problems, mean rank	202.73	212.20	197.13	>0.05
Depressive mood, mean rank	181.64	220.45	228.99	p_{a-b}=0.001 p_{a-c}=0.002 p_{b-c}>0.05
Irritability, mean (SD)	1.68 (0.92)	1.09 (0.95)	0.66 (0.84)	p_{a-b}<0.001 p_{a-c}<0.001 p_{b-c}=0.003
Anxiety, mean rank	182.34	222.43	222.88	p_{a-b}<0.001 p_{a-c}=0.009 p_{b-c}>0.05
Exhaustion, mean (SD)	0.95 (0.55)	1.15 (0.77)	1.03 (0.83)	p_{a-b}=0.029 p_{a-c}>0.05 p_{b-c}>0.05
Sexual problems, mean (SD)	1.20 (0.73)	1.15 (0.78)	1.01 (0.91)	>0.05
Bladder problems, mean rank	196.67	207.50	222.08	>0.05
Vaginal dryness, mean rank	197.35	217.80	197.46	>0.05
Joint and muscle discomfort, mean rank	191.49	219.56	207.50	>0.05
MRS domain scores				
Psychological, mean (SD)	3.13 (1.70)	3.15 (2.01)	2.66 (2.21)	>0.05
Somatovegetative, mean (SD)	5.29 (2.49)	4.52 (2.65)	3.71 (2.60)	p_{a-b}=0.019 p_{a-c}<0.001 p_{b-c}>0.05
Urogenital, mean (SD)	3.09 (1.81)	3.18 (1.90)	3.07 (2.02)	>0.05
MRS total score, mean (SD)	11.51 (5.31)	10.85 (5.87)	9.44 (6.14)	p_{a-b}>0.05 p_{a-c}=0.028 p_{b-c}>0.05

Note: [a] group A, [b] group B, [c] group C.

There were significant differences in sweating/hot flushes and irritability scores among the groups; scores of depressive mood and anxiety in group B and C were higher than those in group A (p<0.05); exhaustion score in group B was higher than group A (p<0.05). Regarding MRS domains, score of somatovegetative in group A was higher than the other two groups; MRS total score in group A was higher than group C (p<0.05).

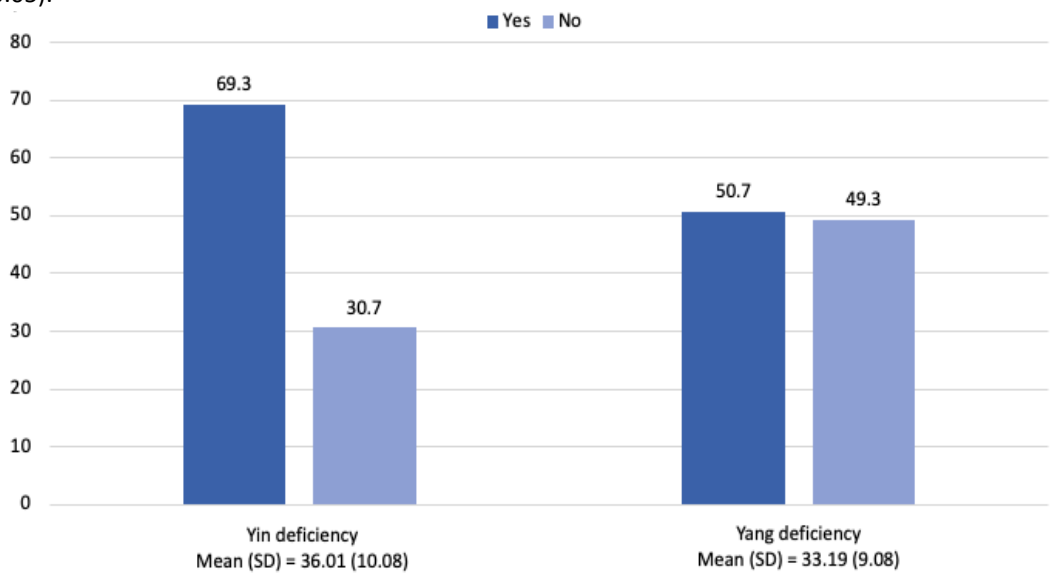

Figure 1. The proportion of Yin deficiency and Yang deficiency constitution

Among 410 menopausal women, 69.3% were Yin deficiency, and 50.7% were Yang deficiency. The mean scores of Yin deficiency and Yang deficiency were 36.01 ± 10.08 and 33.19 ± 9.08, respectively.

Table 4. Multivariable logistic regression model on risk factors for menopausal women with each sub-scale and total score ranging from moderate to severe

Independence variables	Psychological OR (95% CI)	Somatovegetative OR (95% CI)	Urogenital OR (95% CI)	Total OR (95% CI)
Smoking				
Current	9.75 (2.42-39.30)*	1.44 (0.27-7.67)	0.22 (0.03-1.41)	0.42 (0.03-6.41)
Never	-	-	-	-
Alcohol				
Yes	0.79 (0.43-1.44)	2.02 (0.90-4.52)	0.98 (0.30-2.81)	0.53 (0.30-1.67)
None	-	-	-	-
Physical activity				
None	1.60 (0.96-2.66)	1.17 (0.62-2.24)	3.34* (1.42-7.85)	1.13 (0.48-2.61)
Yes	-	-	-	-
Parity	1.45 (1.02-2.06)*	1.32 (0.89-1.97)	0.69 (0.46-1.04)	1.12 (0.71-1.77)
Yin deficiency	1.10 (1.06-1.13)**	1.23 (1.18-1.28)**	1.23 (1.15-1.32)**	1.31 (1.23-1.39)**
Yang deficiency	1.11 (1.08-1.14)**	1.09 (1.05-1.13)**	1.09 (1.03-1.15)*	1.17 (1.10-1.24)**

*Note: *p<0.05; **p<0.001*

The risk factors including: smoking with psychological (OR=9.75; 95% CI: 2.42-39.30; p<0.05); physical activity with urogenital (OR=3.34; 95% CI: 1.42-7.85; p<0.05); parity with psychological (OR=1.45; 95% CI: 1.02-2.06; p<0.05); Yin deficiency constitution with psychological (OR=1.10; 95% CI: 1.06-1.13; p<0.001), somatovegetative (OR=1.23; 95% CI: 1.18-1.28; p<0.001), urogenital (OR=1.23; 95% CI: 1.15-1.32; p<0.001), and total scale (OR = 1.31; 95% CI: 1.23-1.39; p<0.001); Yang deficiency constitution with psychological (OR=1.11; 95% CI: 1.08-1.14; p<0.001), somatovegetative (OR=1.09; 95% CI: 1.05-1.13; p<0.001), urogenital (OR=1.09; 95% CI: 1.03-1.15; p<0.05), and total scale (OR=1.17; 95% CI: 1.10-1.24; p<0.001).

4. DISCUSSION

According to the results, the mean score of total scale was 10.88 ± 5.72; the mean scores of sub-scales were 3.05 ± 1.93 (psychological), 4.70 ± 2.63 (somatovegetative), and 3.12 ± 1.88 (urogenital). Complaints at the moderate level of the sub-scales and total scale both accounted for a higher proportion than other levels. Differences in the scores of symptoms between groups according to the number of years of menopause were presentedin Table 3, in which sweating/hot flushes, irritability, depressive mood, anxiety, and exhaustion were characteristics with significant differences (p<0.05). The hot flush is the most common symptom of decreased estrogen production and is considered one of the signs of menopause [11]. Many theories suggested that hot flushes originated in the hypothalamus and was caused by lack of estrogen, lasting in most women for 1-2 years but in some for longer than 5 years [12]. Some studies had found that about 75% of American women experienced hot flushes during the transition from perimenopause to menopause. This prevalence in Hong Kong was about 10% or up to 62% in Australia [11]. Irritability occurs in about 65% of women during premenopause, 49% during the menopause, 1-3 years after the menopause account for 48% and more than 3 years after the menopause was 17% [13]. According to the study of Nguyen Xuan Bai (2021), irritability tended to gradually decrease with number of years of menopause (under 5 years 67.6%, between 5 and 10 years 65.7%, and over 10 years 58.6%) [14].

Table 3 showed that score of somatovegetative domain in group A was differently higher than the other two groups; MRS total score in group A was differently higher than group C. The somatovegetative domain includes sweating or hot flushes, heart discomfort, sleep disorder, and joint and muscle discomfort. These disorders involve reduced endogenous estrogen production in most women after going through menopause, with the greatest decrease is in estradiol (E_2). Serum E_2 levels change significantly in the climacteric. E_2 levels decrease significantly from two years before the final menstrual period (FMP) and continue to two years after FMP. Between two and six years after the FMP, E_2 concentration is stable with a negligible average rate of change. A second decrease in E_2 concentration may be observed between six and eight years after FMP [15, 16]. Therefore, our results were also relatively consistent with the pathogenesis of dysfunction in menopausal women according to each stage of menopause.

Menopausal symptoms may be influenced by various factors such as low socio-economic status, overweight and obesity, parity. Multivariable logistic regression model on related factors with the severity of dysfunction in the climacteric women was described in Table 5. Psychological score increased significantly in association with smoking and parity (ORs of 9.75 and 1.75; p<0.05). Smoking is one of the risk factors for cardiovascular and metabolic diseases. The cardiovascular disadvantages due to the rapid decline in estrogen levels in menopausal women may lead to brain dysfunction, influencing the development of depressive mood [17]. Table 4 also showed that physical inactivity was a related factor to the severity of urogenital symptoms (OR=3.34; 95% CI: 1.42-7.85; p<0.05). In the study of De Azevedo Guimaraes et al., subjects in the highest active group (maintained or increased to >60 min per day) had less urinary leakage frequency than those classified as weaky or moderately active at 12-week follow-up [18]. Maintaining physical activity as well as having a healthy lifestyle can help women reduce the risk of functional disorders during menopause.

The two constitution types were both significantly related to the severity of each domain and total scale. According to TM, Yin deficiency is the depletion of fluid, humor, essence, and blood, so that yang will be relatively increased with symptoms of excess activity such as hot flushes, palpitations, insomnia, and dryness. Yin deficiency can be caused by estrogen fluctuations, which affect the central hypothalamus and may further reduce cardiac autonomic vagal activity in the climacteric. Yang deficieny is the decline of functions, metabolic activities, and body reactions, in which fatigue, depression, chilliness, and edema are the predominant sym. Yang deficiency constitution is

associated with mitochondrial dysfunction, impaired thermogenesis, or loss of the effectiveness of the pituitary-adrenal axis [8]. Therefore, yin deficiency and yang deficiency constitutions were factors that can potentially impact on psychological, physical or urogenital problems during the climacteric.

5. CONCLUSIONS

This study found that smoking, physical inactivity, parity, yin deficiency and yang deficiency constitution were risk factors for functional disorders in the climacteric. It is necessary to raise women's awareness of the problems that may occur during menopause as well as the factors that make these disorders worse. Results of our study are the basis of developing care plans, consulting and individualizing treatment to alleviate dysfunction and improve the quality of life during menopause.

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