Original Article

Development and Psychometric Evaluation of the Menopausal Self-Care Questionnaire in a Sample of Iranian Postmenopausal Women

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ABSTRACT

Background: Self-care assessment is a prerequisite to self-care promotion interventions. However, there is no specific measurement instrument for self-care assessment among postmenopausal women. **Objectives:** The aim of this study was to develop the menopausal self-care questionnaire and evaluate its psychometric properties in a sample of Iranian postmenopausal women. **Methods:** This methodological study was conducted in 2017 based on Waltz's method for instrument development. Questionnaire items were generated based on a literature review, and then, face, content, and construct validity of the questionnaire were assessed. For construct validity assessment, a sample of 357 women aged 45–60 years were selected through cluster and stratified sampling from health-care centers in Kashan, Iran. Then, exploratory factor analysis was conducted to determine the factor structure of the questionnaire. Moreover, reliability was assessed through calculating Cronbach's alpha and test-retest intraclass correlation coefficient (ICC). **Results:** The primary version of the questionnaire contained 36 items. Two items were deleted due to their limited content validity. The impact scores, content validity ratios, and content validity indices of the remaining 34 items were at least 2.84, 0.70, and 0.70, respectively. During factor analysis for construct validity assessment, one item was deleted and the questionnaire was found to have a seven-factor structure, accounting for 54.87% of the total variance. The factors were general health care, screening, nutrition, memory, hot flashes and night sweats, sexuality, and social communication. The ICC and Cronbach's alpha value for the questionnaire were 0.76 ($P < 0.001$) and 0.88, respectively. **Conclusion:** The menopausal self-care questionnaire is a valid and reliable instrument for self-care assessment among postmenopausal women. It can be used in health monitoring programs for middle-aged and elderly women.

KEYWORDS: *Menopause, Psychometrics, Questionnaire, Self-care*

INTRODUCTION

Menopause, a normal part of women's lives, and women spend almost one-third of their lives after menopause.[1] It is associated with considerable biological, physiological, and social changes.[2] It may be associated with symptoms such as hot flashes, night sweats, insomnia, vaginal dryness,[1] sexual dysfunction,[3] constipation,[4] and emotional and behavioral changes.[5]

Self-care is a key factor behind women's health in postmenopausal period. Self-care refers to informed, learned, and deliberate activities individuals perform to maintain and promote their own and their family members' health and improve their survival.[6] Through self-care activities, women can cope with menopausal problems and improve their quality of life.[7] Yet, evidence shows that they have inadequate self-care in

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postmenopausal period.[8] Postmenopausal women's self-care can be promoted through education. Health education broadens women's knowledge about menopause[9] and helps them more effectively cope with menopausal problems.[10]

Despite the importance of self-care to postmenopausal women's health and well-being, there are limited instruments for its measurement. One of these instruments was developed by Bahri *et al*. and includes five eight-item subscales with a total score of 40–160. They evaluated and confirmed the content validity of their instrument but did not report any data about its construct validity.[6]

Objectives

The aim of this study was to develop the menopausal self-care questionnaire (MSCQ) and evaluate its psychometric properties in a sample of Iranian postmenopausal women.

METHODS

Design

This methodological study was conducted in September to March, 2016.

MSCQ was developed based on the Waltz's method.[11] Accordingly, the conceptual framework of the study and the dimensions of the intended concept were determined, the objectives of measurement were identified, the initial version of MSCQ was generated, and its scoring system was developed.

Through reviewing the relevant literature, Orem's Self-Care Theory was determined as an appropriate conceptual framework for the study. Orem's theory is frequently used in nursing education and practice. The main element of this theory is self-care.[12] Then, the items of MSCQ were generated based on the existing literature on self-care, including textbooks, journals, and articles. The primary MSCQ contained 36 items in physical, mental, social, and information acquisition dimensions. A five-point Likert scale was used for item scoring as follows: "Never:" 1; "Rarely:" 2; "Sometimes:" 3; "Often:" 4; and "Always:" 5.

Face and content validity assessment

Face validity determines whether the items can appropriately measure the intended concept, while content validity determines the extent to which the items cover the intended concept.[9] For qualitative face validity assessment, ten postmenopausal women were asked to comment on the relevance and readability of the items. Subsequently, the items were amended based on their comments. For quantitative face validity assessment, the same women rated the importance of the items on a five-point Likert scale from "Not important" (scored 1) to "Very important" (scored 5). Then, item impact score was calculated through multiplying the relative frequency of women who had rated that item 4 or 5 by the mean importance score of that item (i.e., Relative frequency × Importance). Items with impact score of 1.5 and higher were kept.

Quantitative content validity assessment was performed through calculating content validity ratio (CVR) and content validity index (CVI). Initially, ten experts in midwifery and health education rated each item as either "Necessary," "Useful but not necessary," or "Unnecessary." Then, the CVR of each item was calculated using this formula: $CVR = (n_E - N/2)/(N/2)$, where N was the number of experts who considered that item "Necessary." According to Lawshe, when the number of experts is ten, a CVR of 0.62 or more is acceptable.[13] For CVI calculation, the same experts rated the relevance or specificity of each item as either "The item is irrelevant" (scored 1), "The item needs some amendments" (scored 2), "The item is relevant but needs some amendments" (scored 3), or "The item is completely relevant" (scored 4). Then, CVI was calculated through dividing the number of experts rated that item 3 or 4 by their total number. Items with CVIs more than 0.79, 0.70–0.79, and <0.70 were considered, respectively, as appropriate, acceptable after amendment, and inappropriate.[14] In qualitative content validity assessment, the same ten experts were asked to provide comments on the wording, necessity, simplicity, and clarity of the items. Their comments were used to amend the items.

Construct validity assessment

The necessary sample for construct validity assessment was determined through multiplying the number of MSCQ items by ten.[2] During content validity assessment, two items were excluded and 34 were kept. Therefore, with an attrition rate of 5%, a sample of 357 women was considered adequate. Women were selected from health-care centers in Kashan, Iran, through cluster and stratified sampling. Initially, the city was divided into three main regions according to its habitants' socioeconomic status. Health-care centers in each region were considered as clusters. Then, three centers were selected from each region with the help of the staff affiliated to the Health Administration of Kashan University of Medical Sciences, Kashan, Iran. The criteria for selecting the centers were high rate of referral and wide geographical distribution of the population covered by the centers. The number of women to be recruited from each center was calculated proportionately to the total number of the covered

women. Then, the list of women who referred to each of the selected centers was created and eligible women were selected through simple random sampling. Eligibility criteria were no affliction by serious health conditions, Iranian nationality, a physiological menopause at least 1.5 years before the study, an age of 46–60, no history of hysterectomy or oophorectomy, and no use of hormonal medications, foods, herbs, or herbal preparations in the past 3 months before the study. Women who had limited collaboration or provided incomplete responses to MSCQ items were excluded. Participants personally filled out the 34-item MSCQ. For illiterate participants, the questionnaire was filled out through face-to-face interview. The collected data were used for construct validity assessment.

Construct validity of MSCQ was assessed through exploratory factor analysis. There were some significant correlations among the factors in the component correlation matrix. Thus, as the sample of the study was large enough, principal component analysis with promax rotation was used for factor analysis. The number of factors was extracted based on the scree plot [Figure 1] and eigen values >1.

Construct validity was also assessed through convergent and discriminant validity assessments. For convergent validity assessment, Pearson correlation analysis was used to examine the correlation of MSCQ score with participants' age. The assumption was that lower age at menopause is associated with greater self-care. On the other hand, discriminant validity was assessed through comparing women having different educational levels with each other respecting their MSCQ scores using the one-way analysis of variance. The assumption was that higher educational level is associated with greater self-care. Normality testing was done through the Kolmogorov–Smirnov test. Its results showed

Figure 1: Scree plot of menopausal self-care questionnaire

that the scores of menopausal self-care had normal distribution ($P = 0.393$).

Reliability assessment
For reliability assessment, 30 postmenopausal women from the target population twice filled out MSCQ with a 2-week interval. Then, test-retest intraclass correlation coefficient (ICC) was calculated to assess stability. Moreover, Cronbach's alpha was calculated to assess internal consistency.

Ethical considerations
The Ethics Committee of Iran University of Medical Sciences, Tehran, Iran, approved the study (approval code: IR.IUMS.REC.1395.9223489203). Besides, necessary permissions for entering the study setting and collecting the data were obtained from the Research and the Health Administrations of Kashan University of Medical Sciences, Kashan, Iran. Each participant was ensured that her information would remain confidential, and then, her informed consent was obtained. Study data were collected anonymously by a female research assistant in a private environment.

RESULTS
Instrument development
Initially, a 36-item questionnaire was developed based on the existing literature.

Face and content validity assessment
Content validity assessment revealed that the grammar, wording, and allocation of MSCQ items were appropriate. Two items were deleted due to their conceptual similarities with some other items. Thus, 34 items remained in the questionnaire for further validity assessment. During face validity assessment, all participants reported that they could easily understand the items. The item impact scores, CVRs, and CVIs values of the remaining 34 items were at least 2.84, 0.70, and 0.70, respectively.

Construct validity assessment
In total, 357 postmenopausal women completed the questionnaire. The mean of their age was 53.45 ± 3.95 in the range of 45–60 and the mean of their age at menopause was 49.08 ± 3.73 in the range of 41–59 [Table 1].

Exploratory factor analysis
The value of Kaiser–Meyer–Olkin test was 0.893 and the result of Bartlett's test of sphericity was statistically significant ($\chi^2 = 4042.698$; $P < 0.001$). Therefore, the sample was adequate and the factor analysis model was appropriate. Factor analysis with principal component analysis and promax rotation revealed that MSCQ
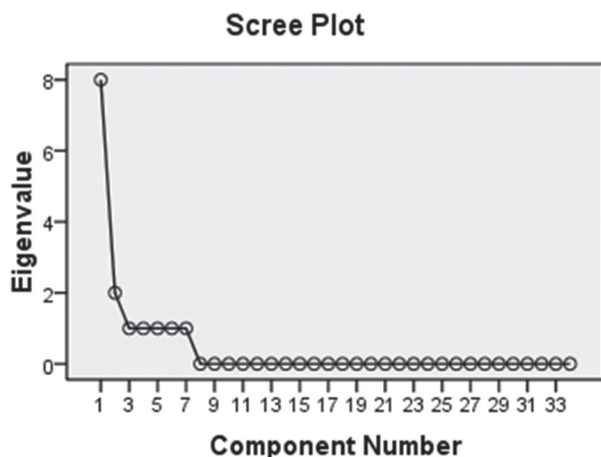
consisted of seven factors with eigenvalues >1. The seven-factor model explained 54.87% of the total variance of menopausal self-care.

The final seven factors of the 33-item MSCQ were as the following:

1. General health care: Eight items
2. Screening: Six items
3. Nutrition: Six items
4. Memory: Three items
5. Hot flashes and night sweats: Three items

6. Sexuality: Three items and
7. Social communication: Four items.

Tables 2 and 3 show the component correlation matrix and the pattern matrix for MSCQ, respectively. As Table 3 shows, some items had strong correlation with more than one factor as it was expected for promax rotation. For example, the item "I avoid the things that aggravate hot flashes (such as spice, sugar, soft drinks, tea, alcohol, and warm environments)" and the item "I use milk and dairy products to prevent osteoporosis" had the strongest correlations with the factors 1 and 3, respectively. Consequently, item allocation to the factors based on factor loading values was not appropriate, and hence, the best factors for such items were determined based on the intercorrelations between factors, the pattern and the structure matrices, and the comments of several experts.[15] The item "I use medications or herbal products (such as Vitagnus) to reduce hot flashes" was also deleted due to its low factor loading (<0.3)[16] and low communality.

Convergent validity assessment revealed that MSCQ score was inversely correlated with women's age at menopause ($r = –0.013$; $P = 0.01$). Moreover, discriminant validity assessment indicated that women with higher educational levels obtained significantly higher MSCQ scores than others ($P = 0.001$). The mean scores of MSCQ for women with no literacy or elementary education, women with secondary education, and women with university degrees were 106.45 ± 19.80, 117.25 ± 21.93, and 120.12 ± 22.17, respectively.

Reliability assessment

The test-retest ICC was 0.76 ($P < 0.001$), indicating acceptable 2-week stability of the questionnaire. Moreover, the Cronbach's alpha of the questionnaire was 0.88.

DISCUSSION

This study aimed to develop a valid and reliable questionnaire for self-care assessment among

Table 1: Participants' demographic characteristics (*N*=357)

Characteristics	*n* (%)	Not responded
Education level		-
Illiterate or elementary	303 (84.9)	
Secondary	46 (12.9)	
University	8 (2.2)	
Employment status		
Homemaker	331 (92.7)	
Worker	11 (3.1)	
Employee, self-employed, or retired	15 (4.2)	
Spouse's educational level		
Illiterate or elementary	230 (64.4)	9 (2.5)
Secondary	7 (2)	
University	111 (31.1)	
Spouse's employment status		
Worker	68 (19.1)	16 (4.5)
Employee	33 (9.2)	
Self-employed	52 (14.6)	
Unemployed	14 (3.9)	
Retired	174 (48.7)	
Marital status		-
Never married	15 (4.2)	
Married	342 (95.8)	
Type of accommodation		
Personal	331 (92.7)	4 (1.1)
Rental	22 (6.2)	
Insurance coverage		
Yes	331 (92.7)	14 (3.9)
No	12 (3.4)	

Table 2: Component correlation matrix for exploratory factor analysis

Component	General health care	Screening	Nutrition	Memory	Hot flashes and night sweats	Sexuality	Social communication
General health care	1.000						
Screening	0.335	1.000					
Nutrition	0.469	0.242	1.000				
Memory	0.510	0.328	0.464	1.000			
Hot flashes and night sweats	0.326	0.204	0.340	0.401	1.000		
Sexuality	0.386	0.176	0.181	0.233	0.085	1.000	
Social communication	0.271	0.180	0.299	0.347	0.205	0.232	1.000

Table 3: The pattern matrix for exploratory factor analysis

Factors and items	Factors						
	1	2	3	4	5	6	7
1-General health care							
I think I know whatever necessary about menopause	0.856						
I do exercise until my heart and respiratory rates increase and I sweat	0.718						
I look for new information to improve my health	0.708						
I take calcium supplement and Vitamin D to prevent osteoporosis	0.635						
I do a light to moderate physical activity (like 30-40 min of walking 3-5 days a week)	0.608						
I accept the things that I can't change in my life	0.445						
I check my weight and try to keep it fit	0.437						
I avoid the things that aggravate hot flashes (such as spice, sugar, soft drinks, tea, alcohol, and warm environments)	0.407		0.396				
I get sun				0.445			
2-Screening							
I undergo menopause-related periodic examinations and screening tests		0.759					
I undergo Pap smear every 3 years		0.759					
I go to doctor every year for gynecological examinations		0.744					
I undergo mammography every year		0.733					
I report any abnormal symptoms to doctor or other healthcare professionals		0.442					
I personally examine my breasts every month		0.439		0.437			
3-Nutrition							
I limit the consumption of black soft drinks and caffeine-containing stuffs			0.825				
I limit the consumption of sugar and sugary, fatty, and high-salt foods			0.744				
I avoid cigarette smoking and drug abuse	−0.443		0.564				
I take adequate amount of all food groups (namely dairy, bread and cereals, protein, fruits and vegetables)	0.366		0.483				
I use milk and dairy products to prevent osteoporosis	0.302		0.362				
4-Memory							
I listen to news or watch movies and tell it to others				0.865			
I use foods that help boost memory (such as walnut and sesame)				0.725			
I study and do crossword puzzles and so on to boost my memory				0.642			
5-Hot flashes and night sweats							
I sleep in a cool place to manage night sweats					0.873		
I regulate the room temperature to reduce night sweats					0.870		
Taking a shower is one of the things I do during hot flashes					0.447		
6-Sexuality							
I use a lubricant during sex						0.703	
I have maintained my marital relationships						0.698	
I refer to a doctor or a counselor if necessary to improve my marital relationships						0.692	
7-Social communication							
I have accepted my social status during the menopause as a new period of life							0.729
I try to completely empty my bladder before engaging in social communications							0.544
I keep personal hygiene (regular bath, toothbrush, handwashing etc.)			0.383				0.478
I have good relationships with people around me							0.303
Explained variance (%)	26.51	6.79	5.78	4.51	4.21	3.78	3.29
Eigenvalue	8.75	2.24	1.91	1.49	1.39	1.25	1.09

Absolute values <0.3 were suppressed

postmenopausal women. Findings revealed acceptable validity and reliability for MSCQ. Its content validity was confirmed by a panel of experts. Moreover, with regard to its face validity, women from the target population could easily understand its items. Factor analysis with principal component analysis and promax rotation showed a seven-factor structure for MSCQ which explained 54.78% of the total variance. A total variance of >50% is considered acceptable.[17,18] The seven factors of the questionnaire were general health care, screening, nutrition, memory, hot flashes and night sweats, sexuality, and social communication. The Cronbach's alpha value of the questionnaire was 0.88, and its test-retest ICC was 0.76. Cronbach's

alpha values >0.60[19] and ICC values >0.70[20] denote satisfactory reliability.

An earlier study also developed an instrument for self-care assessment among postmenopausal women in five subscales of nutrition, physical activity, stress management, healthy lifestyle, and screening for menopausal problems. The content validity of the instrument was confirmed by ten experts and its reliability was confirmed with a Cronbach's alpha of 0.89. However, data on its construct validity were not reported.[6] Rindner *et al*. also developed a questionnaire for assessing menopausal symptoms during menopause transition but did not attend to menopausal self-care.[21] Akinpetide also conducted a study on postmenopausal women to assess their bone promotion behaviors such as physical activity as well as milk and calcium supplements consumption. However, that study mainly focused on menopause-associated osteoporosis,[22] while the focus of the present study was wider and included different aspects of self-care.

Doubova *et al*. also developed an instrument to measure self-efficacy for self-care among postmenopausal women. The four factors of their instrument were active participation in doctor–patient relationship, control over mental health and sexual changes, risk of dying from cancer, and other health risks among climacteric women.[23] That questionnaire was not directly about self-care as well.

The strengths of this study were its large sample recruited from different areas of a city and its high response rate, both increased the generalizability of its findings. Moreover, promax rotation was used to minimize the effects of the correlations among some factors on the findings. On the other hand, one study limitation was related to its low literacy rate among the study participants. Moreover, as MSCQ is a self-administered questionnaire, we were unable to verify the accuracy of participants' responses. Besides, eligible women were hardly accessible because they did not routinely refer to the study setting.

CONCLUSION

Findings of this study show that MSCQ is a valid and reliable instrument for self-care assessment among postmenopausal women. It may also be useful for self-care assessment among middle-aged and elderly women. Of course, to provide more evidence regarding the psychometric properties of MSCQ, further studies are recommended on women from other age groups and also women with chronic health conditions.

Conflicts of interest

There are no conflicts of interest.

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