

Psychometric Properties of the Attitude toward Menopause Checklist-Persian Version: A Comparison between Girls' and their Menopause Mothers' Attitudes

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Abstract

Background: The current study was conducted to examine the psychometric properties, including internal consistency, content validity, construct validity of the scale through which the attitude of girls and menopause women were compared.

Methods: This is a psychometric study on 350 healthy postmenopausal Iranian women referred to healthcare centers in Semnan and Mashhad cities. The study is conducted in two phases: revalidating the scale of Attitude toward Menopause (ATM) in the Iranian context and then comparing the attitudes of girls and menopause women. Due to the special circumstances caused by the Corona crisis and the lack of direct access to girls, as well as the limited research time, a number of ATM questionnaires were completed online and some in person by 200 postmenopausal women and 200 adolescent girls.

Results: Mean age of subjects were 55.45 ± 5.58 years. Cronbach's alpha was 0.68% and original modified model was reported to be unidentified. Therefore, the exploratory factor analysis was performed through principal-component analysis with varimax rotation. Given the results of scree plot, eigenvalues and the interpretability of the different factor solutions, five factors were identified as the most appropriate predictors of attitude toward menopause. These five factors explained 48% of variance. In the second phase of the study, 200 postmenopausal women and 200 girls participated. The mean score of attitude of postmenopausal women was 45.67 and the mean score of attitude of girls was 48.75. The difference between the mean scores was found to be statistically significant ($P < 0.001$). The correlation coefficient between age and attitude score was equal to ($r = -0.228$, $P < 0.001$). In other words, for each year of increasing the age of the participants, their attitude score was reduced by 0.228 and this decrease was significant.

Conclusions: Our findings revealed that attitude toward menopause Checklist (ATM) should be modified in accordance with Iranian culture to predispose for feasible assessment of attitudes towards menopause. Further investigations are needed to evaluate all of the psychometric properties of this scale. The findings of the second part of the study showed that the attitude of adolescent girls is significantly more positive than postmenopausal women.

Key Words: Attitude toward menopause, Girl, Menopause, Psychometric properties.

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1- INTRODUCTION

Menopause refers to the permanent discontinuity of menstruation that can be confirmed when no periods occur for 12 consecutive months; and commonly occurs between ages of 48 and 54 years with the mean age of 51 years. The menopausal women population around the world is projected to increase up to 1.2 billion by 2030 and up to 4.5 million each year (1, 2).

One of the important phenomenon in the life of the females is the menopause that is associated with endocrine and somatic variations and even influences the individual psychologically (3). This period of life can affect the women negatively in a magnitude of loss of job or spouse as exemplified by Helen Deutsch (1945) who "referred to loss of reproductive life as a partial death" (4). The perceptions and beliefs of a woman about menopause might be influenced by many parameters, such as menopausal status, social background, education, occupation, physical and emotional health, general symptoms (5) and attitude (1). The attitude toward menopause is different from country to country and even culture to culture (1). Therefore, it is important to determine the attitude toward menopause in various cultures and countries, but limited instruments have presented in this regard (3, 6, 7). Among these, Attitude Toward Menopause check list (ATM) is widely used in modified (8) or total forms (9, 10). Most of the studies only reported internal consistency using Cronbach's alpha ranged from 0.68 to 0.85 (3, 8, 9, 11). Only one study examined its factor structure using exploratory factor analysis and showed that seven factors of the model could be fit with data and explained 0.85% of variance (3). The validity and reliability of the ATM has been evaluated in Iran (9), but not its construct validity. Therefore, there is need for measuring validity, reliability and construct validity

of this important scale. Examining the factor structure of ATM will help in testing the previous seven-factor model, and will help in exploring a factor structure that better fits with the data. This study can also be as a base for other studies across the world as there has been only one study assessing factor structure. Accordingly, the aim of the current study is to examine psychometric properties, including internal consistency, content validity, and construct validity.

2- MATERIALS AND METHODS

Ethics Committee of Semnan University of Medical Science (Ethics code of IR.SEMUMS, REC.1396.82) in Iran approved the present cross-sectional study, whose samples were gathered in Semnan and Mashhad cities. The subjects, who were older than 45 years with amenorrhea for at least one year, signed informed consent forms. The exclusion criteria were severe medical diseases or psychiatric disorders. Mashhad city and Semnan divided into four areas of north, west, south and east. Then, eight centers from Mashhad city and two centers from Semnan city were randomly selected for data collection. Sampling in each center was performed by the use of convenience sampling method.

2-1. Attitude toward menopause

Neugarten et al., in 1963 developed the checklist of women's Attitudes Toward the Menopause (ATM) (3). Primarily, the checklist was generated based on in-depth interviews and literature review. Each statement is rated using four-point Likert scale (1=agree strongly to 4=disagree strongly). The checklist was validated in a pilot study of 50 women aged between 45 to 50 years. Based on response feedback, the questionnaire was revised and the number of items was reduced to 35 items and 34 items were divided into seven categories, including "extent of continuity", "post-menopausal recovery",

"negative affect", "control of symptoms", "psychological losses", "sexuality", and "ungrouped items" assessing different aspects of ATM. An item "A woman has comfortable feeling and clean after menstruation cessations" was added to questionnaire based on experts' comments.

2-2. Translation and cross-cultural adaptation

The questionnaire was translated into Persian language in the following five steps based on the standard guidelines developed by Beaton (12)

a) Forward translation: Two bilingual translators whose mother tongue was Persian performed forward translation; and one of them had work experience in menopause clinics for more than 8 years.

b) Synthesis of translations: Two translators together with the first and third authors reviewed and discussed translations and then merged it to a single Persian version.

c) Backward translation: a translator who was native English speaker back translated the synthesized version (Persian version) into English version.

d) Expert committee: The expert committee composed of all translators (backward and forward translators), three reproductive health specialists, a gynecologist and two psychologists reviewed all translations and reached a consensus on any discrepancy to draft the pre-final version.

e) Testing the pre-final version: The pre-final version was pre-tested in a pilot study of 50 menopausal women.

2-3. Content validity

Concerning content validity, content validity ratio (CVR) and content validity index (CVI) were assessed. The expert committee composed of two faculty members of Mashhad University of Medical Sciences specialized in

reproductive health, one faculty member of Ferdowsi University of Mashhad, specialist in instrument designing; and two psychologists of Semnan university of Medical Sciences. The CVR was calculated based on Lawshe's approach (13).

The expert committee was requested to rate the necessity of each item regarding the three-point Likert scale (1=essential, 2=useful but not necessary, and 3=not necessary).

The Waltz and Bausell's approach was used to measure the CVI (14) by the same experts for scoring the relevancy, transparency, and ease of comprehension in each item through a four-point Likert scale, indicating $CVI > 0.79$ for acceptable, $CVI = 0.70$ to 0.79 for the need of revision, and $CVI < 0.70$ for inappropriate. All items of CBQ had a $CVI = 1$.

2-4. Reliability

Internal consistency was applied to determine the reliability of the questionnaire. The Cronbach's alpha was calculated to obtain internal consistency. The Cronbach's alpha over 0.7 was considered to be acceptable (15).

2-5. Construct validity

The factorial structure of CBQ was measured using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

2-6. Sample size

The sample size was determined based on a rule of thumb. The sample size of 200 subjects or more was suggested for CFA and the sample size of 380 in current study was higher than the proposed value.

The research method of the second stage is descriptive-analytical. Due to the special circumstances caused by the Corona crisis and the lack of direct access to girls, as well as the limited research time, most of the girls and menopausal women

completed the menopause attitude questionnaire online.

Finally, 200 adolescent girls (11-18) and their 200 postmenopausal mothers were included in the study

In this stage, the Menopause Attitude Questionnaire, validated in the previous phase of the study, was applied. The information was considered completely confidential and the participants in the study were free to leave the study at any stage of completing the questionnaire.

2-7. Statistical analysis

The CFA was performed in AMOS 18 (<http://www.ibm.com/software/products/en/spss-amos>). Maximum-likelihood method was used to estimate the parameters. The Three following indicators were applied to determine whether the 7-factor model had an appropriate fit with data; they included comparative fit index (CFI), goodness-of-fit index (GFI) and the root mean square error of approximation (RMSEA). The threshold value greater than 0.9 was suggested for CFI and GFI(16) and the threshold value less than 0.08 was suggested for RMSEA (17). Items with factor Loadings below 0.4 were deleted, as recommended by Hagger et al. (18). In chi-square the degree of freedom ratio below 0.5 is considered appropriate as suggested by March et al. in 1985 (19). The exploratory factor analysis was carried out using principle –component analysis with varimax rotation. Kaiser-Myer-Olkin (KMO) was applied to examine the sampling adequacy that should be greater than 0.5. Eigenvalues and scree plot were used to determine the number of factors.

The second purpose of the study was to compare the attitudes of adolescent girls (under 18 years old) with postmenopausal women regarding menopause. Frequency and standard deviation were calculated in data analysis. In the inferential statistics

section, Colmogorov Smirnov test was performed to check the normal distribution of quantitative variables; t test and chi-square were then used to analyze the data.

3- RESULTS

All subjects returned the completed questionnaire. The mean age of subjects was 55.45 ± 5.58 years. About half of subjects had between 2 and 5 children, and 2% of subjects were single, 82.3 % were married and the rest were divorced. Over two thirds of subjects had educational levels under high school; and only 3.4% had academic degrees. Seven cases had CVI less than 0.70 and five had CVR below 0.85%, all of whom were removed from the study. The confirmatory factor analysis was used to test factorial structure. The modified model was run. No fit indices and modification indices were displayed by AMOS, suggesting that the modified model was unidentified. Therefore, we conducted an exploratory factor analysis through principal – component analysis with varimax rotation. The eigenvalues larger than 1 suggested that 7 factors should be extracted. According to the scree plots, five factors could be extracted because the slope of the curves reached zero. Given the results of scree plot and eigenvalues and the interpretability of various factor solutions along with the literature review, five factors structures were identified as the most appropriate solutions for predicting the attitude towards menopause. Factors 1 and 2 were called "post-menopausal recovery" and "negative affect" similar to the original scale. Factor 1 consisted of nine items (1 to 9) and factor 2 had six items (10 to 17). Factor 3 composed of two items labeled "Physical change ". Factor 4 consisted of three items labeled "loss of worry about menstruation problem and pregnancy" and factor five composed of two items labeled "social interaction ". KMO was 0.802 and Bartlett's Test of Sphericity confirmed the independence of

factors and the feasibility of factor analysis (chi-square=1.652; df=276; $p < 0.0001$). The eigenvalues of the first

five factors were 4.64, 2.80, 1.56, 1.47 and 1.19, respectively. The five factors explained 48% of variance.

Table-1: characteristics of menopausal women included in the study

N (%)	Variable	N (%)
Levels of education of women	Illiterate	128(36.6%)
	Primary/ middle school	145(41.4)
	High school	27(7.7%)
	diploma	36(10.3%)
	University	12(3.4%)
	Missing data	3(0.9%)
Levels of education of spouse	Illiterate	116(33.1%)
	Primary/ middle school	133(38 %)
	High school	31(8.9%)
	diploma	52(14.9%)
	University	18(5.1 %)
	Missing data	3(0.9%)
Marital Stats	Single	7(2 %)
	Married	288(82.3%)
	Divorce	53(15.1%)
	Missing data	6(2 %)
History of Smoking	Yes	41(11.7%)
	NO	308(88%)
	Missing data	3(1%)
Income	<400\$	152(43.4%)
	400-700\$	147(42%)
	>900\$	51(14.6%)
Number of children	≥ 2	33(9.4%)
	2-5	194 (55.4 %)
	≤ 6	123(35.1%)

Table-2: Principal component analysis with varimax rotation of the Iranian modified version of attitude toward menopause checklist (ATM)

NO.	Construct	Items	Factor 1	Factor 2	Factor 3
1	post – menopausal recovery	Women are generally calmer and happier after the change of life	0.770		
2		After the change of life, a woman has a better relationship with her husband	0.754		
3		Life is more interesting for a woman after menopause	0.757		
4		After the change of life, a woman gets more interested in community affairs than before.	0.702		
5		A woman gets more confidence in herself after the change of life	0.641		
6		A woman has a broader outlook on life after the change	0.629		
7		After the menopause a woman is more interested in sex than before	0.598		
8	Negative effect	Menopause is an unpleasant experience		0.684	
9		In truth, just about every woman is depressed about menopause		0.662	
10		Women think of menopause as the beginning of the end		0.610	
11		It is no wonder women feel down in the dumps at the time of menopause		0.557	
12		Women worry about losing their minds during the menopause		0.584	
13		Women often use the change of life as an excuse for getting attention		0.493	
14		A woman is concerned about how her husband will feel about her after menopause		0.438	
15	physical change	The only difference between a woman who has been through menopause and one who has not is that one menstruates and the other doesn't			0.767
16		Changes inside the body that women cannot control cause all trouble at menopause			0.763

3-1. Findings related to the second phase of the study

200 menopausal women and 200 girls participated in this study. The mean age of women was 54.62 ± 5.47) and girls were 14.87 ± 3.24) which were significantly

different ($P= 0.001$). The mean score of postmenopausal women was 45.67 ± 5.66) and the mean score of attitude of girls was 48.75 ± 5.74 , the difference of which was statistically significant ($P=0.001$).

Table 3 shows the mean score comparison of each of the attitude questions between postmenopausal women and girls. The correlation coefficient between age and attitude score was equal to ($r=-0.228$,

$P=0.001$). In other words, for each year of increasing the age of the participants, their attitude score was reduced by 0.228 and this decrease was significant.

Table-3: Comparing the mean scores of each attitude question between postmenopausal women and girls

Item	group	Mean	Std. Deviation	P-Value
Women are generally calmer and happier after the change of life	girl	3.43	0.829	<0.001
	mother	3.08	1.075	
Life is more interesting for a woman after menopause	girl	3.32	0.860	0.001
	mother	3.00	0.955	
A woman is concerned about how her husband will feel about her after menopause	girl	3.13	0.887	0.007
	mother	2.88	0.905	
After the change of life, a woman has a better relationship with her husband	girl	2.97	1.019	0.202
	mother	2.84	0.986	
A woman gets more confidence in herself after the change of life	girl	2.74	1.127	0.210
	mother	2.61	0.915	
A woman has a broader outlook on life after the change	girl	3.01	0.913	0.000
	mother	2.63	0.938	
After the menopause a woman is more interested in sex than before	girl	3.00	0.985	0.039
	mother	2.78	1.061	
It is no wonder women feel down in the dumps at the time of menopause	girl	3.27	0.894	0.372
	mother	3.17	1.112	
In truth, just about every woman is depressed about menopause	girl	3.11	0.838	<0.001
	mother	3.48	1.116	
Women think of menopause as the beginning of the end	girl	2.68	1.056	<0.001
	mother	3.98	1.063	
Menopause is an unpleasant experience	girl	3.58	0.596	<0.001
	mother	2.43	0.991	
Women worry about losing their minds during the menopause	girl	2.70	1.071	.001
	mother	2.34	1.064	
Women often use the change of life as an excuse for getting attention	girl	3.33	0.918	<0.001
	mother	2.84	1.098	
only difference between a woman who has been through menopause and one who has not is that one menstruates and the other doesn't	girl	2.44	1.073	0.804
	mother	2.41	1.136	
Changes inside the body that women cannot control cause all trouble at menopause	girl	2.84	1.219	0.360
	mother	2.73	0.969	
After the change of life, a woman gets more interested in community affairs than before	girl	3.26	0.757	<0.001
	mother	2.63	1.054	

Table-4: Comparison of the Attitude Scores of Menopausal Women and Girls by Neutralizing the Effect of Age by Linear Regression

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	55.785	1.877	-	29.724	0.000
	group	-9.406	2.693	-.796	-3.492	0.001
	age	0.160	0.066	0.548	2.407	0.017

a. Dependent Variable: attitude

As shown in **Table 4**, while considering the age, the group variable affects the attitude score.

4- DISCUSSION

This is the first study measuring the factorial structure of ATM Questionnaire, in Iran. The objective of the study in the first phase was to test the psychometric properties of the ATM including reliability (internal consistency), and factorial structure (CFA and EFA). To the best of the authors' knowledge, this is the first Study aimed to validate and administer ATM questionnaire in a sample of infertile women. The second phase of the current study aimed at assessing the statistical difference between the attitudes of 200 girls and their Menopausal mothers towards Menopause, through the validated scale.

Overall, the scale has a moderate degree of internal consistency (alpha ranged 0.70-0.79), and good construct validity when administered to Iranian infertile women. Five factors were emerged using exploratory factor analysis that explained 48 of variances.

The use of Item Response Theory (IRT) will allow the researchers to explore deeper into the psychometric characteristics of each item, and thus provides them with a higher sense of confidence to keep only important items in the instrument.

Third, we did not performed this analysis within the framework of classic test theory (CTT). Therefore, a more detailed analysis with a larger sample (>1000) using IRT model needed to be conducted in future before the instrument can be finalized, if possible. Longitudinal data would be helpful in understanding the agreement. Hence, this questionnaire may be a valid and reliable instrument to use for both research and clinical purposes. It can also be helpful in identifying the factors affecting fosterling adoption in future research.

A small number of indicators may suffice to identify the construct precisely (20). However, the likelihood of biased parameter estimates and standard errors may increase with the co-occurrence of factors that have a small number of indicators (2 to 3 or less) (21) While development of additional items to measure the identified subscales is needed to accurately evaluate the structure of "the physical change", this would decrease the value of the ATM as a brief screening measure in practice.

Cronbach's alpha in the current study was less than that of the original English version (0.86)(3) and Turkish version (0.79)(11), but were higher than that those reported in the African version (0.6%)(8). Cronbach's alpha for the 24-item modified version in the current study was less than the 34- item Persian version conducted in Shiraz, Iran(9). Indiscrepancy in values of Cronbach's alpha between the current and

other studies can be related to the number of items included in these studies.

The five-factor structure identified in the current study was inconsistent with the seven-factor structure reported by Neugarten. These authors performed the exploratory factor analysis using principle component analysis with varimax rotation on 35 items and suggested a seven-factor, including extent of continuity, post-menopausal recovery, negative affect, control of symptoms, psychological losses, sexuality, and ungrouped items. These factors explained 85% of the variance.

In the current study on 24 items, five factors were emerged. Factors one and two were called "post-menopausal recovery" and "negative affect" similar to the original scale. Three new factors were labelled as follow: "loss of worry about pregnancy and menstruations", "physical change" and "social interaction".

Qualitative studies performed in Iran showed that menopausal women are concerned about loss of reproductive power(22). In some other qualitative studies, the parameters such as physical change (23) and social interaction (24, 25) have been considered as main themes emerged from in-depth interviews.

The second phase of this study compared the attitudes of postmenopausal girls and women towards menopause. The results of this study indicated that there is a significant relationship between age and attitudes towards menopause. As women get older, they adopt more negative attitudes about menopause; and girls have more positive attitudes towards menopause compared to postmenopausal women.

Attitudes toward menopause vary from community to community and even within a community. One of the reasons for the difference in attitudes toward menopause is age (27). The results of the study by Erbil et al. showed that there is a

significant relationship between age and attitudes toward menopause; and along with increasing age, attitudes score decreases. This finding was in line with the results of the present study (28). Perhaps one of the reasons behind the relationship between menopause and aging is the emergence of negative thoughts along with aging in women who consider menopause as a sign of aging (29). However, in the study of Tortumluoglu et al., no correlation was observed between menopausal attitudes and age (30). Nevertheless, the results of Standing et al.'s study showed that there is a positive relationship between age and attitudes toward menopause, so that they acquire more optimistic attitudes toward menopause, as they experience an increase in age (31). Likewise, in a study by Cheng et al., the experience of menopause seems to lead to a positive attitude in women (32).

Attitudes toward menopause determine how menopause is interpreted and understood in women. Numerous factors such as menopausal status, social background, education as well as physical and emotional health affect women's attitudes toward menopause (33). Acceptance of menopause as a disease or a natural phenomenon is one of the factors in the formation of menopausal attitude (34). Spirov believes that there are plausible physiological reasons for changes in menstrual function, and that physiological understanding leads to a natural and positive attitude toward menopause (35). In the past, due to the cultural reasons of the society, most adolescents were deprived of receiving information about menstruation (36). Today, however, the World Health Organization and UNICEF place special emphasis on educating adolescents about puberty and menstrual health (37). Teaching about menopause can also help preparing for it (38). Girls' awareness of

menstruation and school health issues seems to have had a positive effect on menopausal attitudes. On the other hand, the attitude and the way of providing information about menstruation from mother to daughter play an essential role in girls' views; So that the positive attitude of mothers leads to a positive attitude towards menstruation and menopause in girls (29).

Women who experience menopausal symptoms may interpret their symptoms as a sign of aging, and if they have a negative attitude toward aging, their symptoms will worsen (40). The interference of menopausal symptoms and complaints with women's daily work and activities has a significant impact on their views and attitudes toward menopause. Flushing is one of the most obvious symptoms of menopause. Changes in basal body temperature are accompanied by a sudden awakening from sleep at night, which in turn leads to irritability, depression, memory changes, decreased concentration and fatigue in women. These symptoms eventually lead to a decrease in a person's ability to perform daily tasks and ultimately to a decrease in his social functions (41, 42). In the present study, the experience of symptoms in postmenopausal women could be one of the factors leading to a decrease in attitude scores of the girls.

Another reason behind the positive attitude towards menopause in premenopausal ages might be the negative attitude towards menstruation. Some characteristics of the menstrual cycle lead to a negative attitude towards menstruation. Girls with irregular and heavy menstruation, due to limited performance in school, swimming and heavy sports, have a negative attitude towards menstruation and are more inclined to suppress menstruation (43, 44). On the other hand, menstrual cycles between 14 and 20 days were most

associated with a positive attitude toward menopause. Girls with irregular menstrual cycles view menopause as a way to get rid of regular menstruation (39).

5- CONCLUSION

Our findings showed that ATM should be modified in accordance to Iranian culture to predispose for feasible assessment of attitude toward the menopause. This study confirmed the reliability (internal consistency), as well as content and the construct validities (confirmatory factor analysis and EFA) of ATM in the Iranian context. Further investigations are needed to evaluate all of the psychometric properties of this scale. As the analysis of attitudes towards menopause revealed, the girls, overall, processed more positive attitudes than the menopausal women.

6- STRENGTHS, LIMITATIONS AND RECOMMENDATIONS FOR FUTURE STUDIES

The strength of this study was that the findings could be generalized to overall population of Iranian menopausal women because of large sample size along with the collection of data in the multicultural city of Mashhad. This study like all other studies has several limitations that we tried to address to the extent possible. Firstly, our data might be affected by bias selection due to the purposive sampling used instead of random sampling. It possibly limited the generalizability of these findings to other population. Secondly, test-retest reliability of ATM Check list was not performed in the current study; it should be considered in future studies to improve comprehensive psychometric evaluations.

Thirdly, the factors had only three or less than three indicators, reflecting a short screening tool. Although, small number of items loaded on each factor does not necessarily decrease precision(26). However, it may lead to an increase in

biased parameter estimates and standard errors(21). Therefore, Findings of current study recommend that it had been better to add items to subscales with small number of indicators (21) Also, further studies can determine the validity of ATM in cross-cultural settings.

7- CONFLICT OF INTEREST

No conflict of interest

8- ACKNOWLEDGMENT

None

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