Predictors of Health-Related Quality of Life in Postmenopausal Women: A Population-Based Study

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ABSTRACT

Introduction: There have been limited studies on quality of life and its predictors among postmenopausal women. Due to the importance of this subject in health promotion, this study was performed to assess quality of life and its predictive factors in postmenopausal women living in Ilam, Iran. *Methods:* In this descriptive correlational study, 400 postmenopausal married women who aged 50-59 years old and lived in Ilam were recruited from 80 randomly selected clusters. The participants were interviewed by a female interviewer using the standard questionnaire of quality of life (SF-36). Data was analyzed by analysis of variance (ANOVA), student's t-test, and linear regression analysis in SPSS. *Results:* Mean scores (standard deviation) of quality of life in 4 dimensions of physical functioning, general health, mental health, and vitality were 76.8 (19.2), 71.1 (29.2), 74.3 (18.8), and 73.1 (19.6), respectively (with possible range of 0-100). According to linear regression analysis, women with chronic diseases, vasomotor symptoms, or insufficient family income and divorced and widowed subjects had significantly lower scores in all the 4 dimensions of quality of life. Aging was associated with reduced quality of life only in physical functioning dimension ($p < 0.001$). Although in univariate analysis, quality of life was significantly lower among illiterate participants and those with more children and longer duration of menopause at least in one dimension, the differences were not found to be significant in linear regression analysis. *Conclusion:* Chronic diseases, vasomotor symptoms and insufficient income were strong predictors of all the 4 dimensions of quality of life of postmenopausal women. Therefore, interventions are necessary to improve quality of life and health among this group of individuals.

Introduction

Menopause is the permanent cessation of menstruation that occurs naturally or unnaturally around the age of 51 in women.[1,2] New advances in medical sciences has increased life expectancy, especially in women.[3] Today, most women spend more than one third of their life after menopause.[4] It is predicted that the total number of postmenopausal women worldwide will increase from 476 million in year 1990 to 1200 million in 2030. The portion of postmenopausal women living in developing countries is also expected to increase from 40% to 76%.[5] Similarly, the number of middle aged women in Iran has raised dramatically in recent years. Considering that the relative frequency of female population of reproductive age is currently very high in the country,[6] we will witness a very rapid growth in the number of middle-aged people in the coming years.

Physiological changes during menopause can cause a series of vasomotor symptoms such as hot flashes, night sweats and palpitations. They can also result in various mental problems such as lowered self-esteem, depressed mood, irritability, memory loss, difficulty in concentrating and anxiety attacks, as well as sexual dysfunctions.[7,8] Moreover, due to aging, menopause is in many cases associated with reduced physical activity and onset or exacerbation of underlying conditions such as diabetes, osteoporosis, cardiovascular, respiratory, and musculoskeletal diseases. Social status of women also changes since children leave home and grandchildren are born. All these changes can affect the quality of life among women.[8,9] Other factors such as culture, socioeconomic status, living location, and ethnicity along with people's perceptions towards this period can also influence quality of life among postmenopausal women.[4,10]

Ilam, a border city in Iran, is considered to have medium levels of quality of life indicators.[11] It is a highland city which is located in western Iran. It has a population of 550 thousand people whose language is predominantly Kurdish. Menopause age in Ilam is 47.7 years[12] which is lower than other cities such as Tehran (49 years)[13] and the world (51 years).[1,2] The limited available information about quality of life among women after menopause belongs to either other countries[4,14,15] or other regions of Iran (Tehran, Isfahan, and Kashan)[13,16,17] with different culture and socioeconomic status compared to Ilam. Despite the importance of determining the predictive factors of quality of life in designing quality of life promotion programs for postmenopausal women,[18] little attention has been paid to this issue in previous studies. Therefore, the present study was conducted to assess the 4 dimensions and predictors of quality of life among postmenopausal women in Ilam.

Materials and methods

This descriptive correlational study was performed on 400 postmenopausal married women from Ilam during summer 2011. The participants aged 50-59 years old and their menopause started 1-10 years prior to the study. Women who had undergone a surgical procedure or those who had experienced any severe mental stress such as an accident or loss of a family member during the past 3 months were excluded. Individuals with a history of hysterectomy, chronic diseases (except cardiac diseases, diabetes, depression, urinary incontinence, and backache), complicated heart attack, stroke, or any type of mental illness were also excluded.

Considering mean = 75.1, SD = 22.4, and SE = 1.4 for physical functioning (a dimension of quality of life which gives highest sample size) based on the results of a study in Tehran[19] and design effect = 1.5, the required number of subjects to determine the average score of quality of life was calculated as 400. The design effect was estimated considering 5 individuals from each cluster and an intracluster correlation coefficient (ICC) of 0.12 based on a previous pilot study. This number was sufficient for mean comparison of the groups. After approval of the Ethics Committee of Tabriz University of Medical Sciences (Tabriz, Iran), random cluster sampling was used to select 80 women from the female residents of Ilam who aged 45-54 years in 2006 (according to the census report of the Iranian Statistics Center). We started sampling within each cluster from postal address of these people and continued it on the right side until finding 5 eligible postmenopausal women (resulting in a total number of 400 women).

Data was collected through interviews by a female interviewer who ensured the participants about the confidentiality of information and their right to leave the study as they wished. After receiving written consents, a standard questionnaire including demographics and quality of life items was

anonymously filled out for each participant. If a subject was not present for the interview, she was given a second chance. In case of a second absence, the interviewer selected another woman from that cluster.

The results presented in this paper are part of a larger study which evaluated both quality of life and sexual function of postmenopausal women and their husbands. We used 25 questions out of 36 items of SF-36 which is a standard tool to measure general health quality of life and has been used in many studies in different countries.[20] In Iran, the validity and reliability of this questionnaire have been approved by Montazeri et al.[19] for all age groups (Cronbach's alpha = 72-94%) and by Eshaghi et al.[21] for the elderly. Due to the low socioeconomic levels of the participants and the need for performing interviews, the questionnaire seemed to be too long. Therefore, with a pilot study and the use of test-retest, 4 out of 8 dimensions of quality of life that were hard to understand were eliminated. Finally, 25 questions including 15 physical health questions (10 and 5 items to assess physical functioning and general health, respectively), 9 mental health questions (5 and 4 items to evaluate mental health and vitality, respectively), and 1 question to individually assess changes in health status during a period of one year were selected and used.

Scores of subjects in each dimension ranged between 0 and 100. The higher scores indicated better quality of life. Data analyses were performed in SPSS$_{13}$ (SPSS Inc., Chicago, IL, USA). The relations of demographic and reproductive variables with quality of life were investigated using analysis of variance (ANOVA), student's t-test, and linear regression analysis. P values less than 0.05 were considered significant.

Results

Overall, 25 subjects were unwilling to participate and 12 others were excluded due to various reasons such as skin diseases,

disability, mental disorders, multiple sclerosis, advanced rheumatoid arthritis, heart attack or stroke, enduring effects of stroke (8 people), or having had a surgery (2 people), and loss of family members (2 people) during the past 3 months. These individuals were replaced by other eligible women.

The mean (SD) age of the subjects was 54.2 (2.8) years. More than half of them (57%) were illiterate and the majority (95%) were housewives. More than 3 quarters of the women (77.7%) had 5 children or more. They had experienced their last menstrual period 53.2 (33.1) months prior to the study (Table 1). The mean scores of quality of life in physical functioning, general health, mental health, and vitality were 76.8 (19.2), 71.1 (29.2), 74.3 (18.8), and 73.1 (19.6), respectively.

Table 1. Demographic factors of the participating women (n = 400)

Characteristics	N (%)
Age (years)	
50-54	226 (56.5)
54-59	174 (43.5)
Education level	
Illiterate	228 (57.0)
Without high school diploma	141 (35.3)
With high school diploma	22 (5.5)
University	9 (2.2)
Employment status	
Housewife	379 (94.8)
Other	21 (5.2)
Number of children	
0-3	46 (11.5)
4-6	215 (53.7)
≥ 7	139 (34.8)
Chronic disease	
No	203 (50.7)
Yes	197 (49.3)
Divorced or widowed	
Yes	21 (5.2)
No	379 (94.8)
Vasomotor symptoms	
Yes	288 (72.0)
No	112 (28.0)
Household income	
Insufficient	198 (49.5)
Partly sufficient	163 (40.8)
Sufficient	39 (9.7)
Postmenopause duration (Years)	
< 4	197 (49.2)
4-6	108 (27.0)
7-10	95 (23.8)

According to crude analysis, the mean scores of all 4 dimensions of quality of life were significantly lower among women with insufficient family income, vasomotor symptoms, or chronic diseases, and widowed or divorced subjects. Moreover, the mean scores of all dimensions of quality of life were lower among women with 55-59 years of age, illiterate women, housewives, and those whose menopause had started at least 4 years before. Aging and illiteracy were associated with lower score in 3 of the 4 dimensions. Longer duration of menopause was significantly associated with only lower score of physical functioning. Employment, on the other hand, had no significant association with any of the dimensions. Number of children was inversely associated with mean scores of quality of life in all dimensions, i.e. women with less than 4 children had the highest mean scores. ANOVA showed significant differences in all the dimensions except general health (Table 2).

According to the results of linear regression analysis, having a chronic disease or vasomotor symptoms, being widowed or divorced, or having insufficient household

Table 2. Mean scores of different dimensions of quality of life among the participants (n = 400)

Characteristics		Number	Subscales of SF-36			
			Physical Function	General Health	Mental Health	Vitality
Age (years)	50-54	226	81.3(18.2)	72.9(30.0)	76.2(19.4)	75.0(20.7)
	55-59	174	70.9(18.9)	68.8(28.1)	71.8(17.9)	70.5(17.8)
p			<0.001	0.168	0.020	0.020
Education	Illiterate	228	70.1(19.9)	68.1(30.7)	73.6(19.1)	71.3(20.1)
	Literate	172	80.3(17.7)	75.1(26.2)	75.2(18.5)	75.4(18.7)
p			0.001	0.017	0.420	0.040
Employment status	Housewife	379	76.5(19.2)	70.8(29.4)	74.1(19.0)	72.7(19.8)
	Employed	21	81.9(19.2)	76.8(26.1)	78.9(15.8)	80.2(15.5)
P			0.207	0.360	0.256	0.085
Household income	Insufficient	198	71.1(20.1)	65.0(30.6)	71.1(19.1)	68.3(20.2)
	Partly sufficient	163	80.7(17.3)	75.2(27.4)	76.0(17.8)	76.4(17.8)
	Sufficient	39	83.8(16.6)	85.3(21.2)	83.5(18.1)	83.3(16.8)
p			<0.001	<0.001	<0.001	<0.001
Divorced or widowed	Yes	21	67.9(22.1)	53.8(34.1)	64.4(16.7)	60.2(21.6)
	No	379	77.2(19.0)	72.1(28.7)	74.9(18.8)	73.8(19.3)
p			0.029	0.005	0.013	0.002
Number of children	0-3	46	82.0(16.5)	75.2(25.2)	77.7(18.5)	77.2(17.2)
	4-6	215	78.3(19.6)	72.8(29.8)	75.7(18.3)	74.3(19.8)
	≥7	139	72.6(18.9)	67.1(29.3)	71.1(19.4)	69.8(19.7)
P			0.003	0.123	0.033	0.035
Vasomotor symptoms	Yes	288	74.0(19.2)	66.0(30.1)	70.9(18.7)	69.6(20.1)
	No	112	83.8(17.6)	84.2(22.0)	83.1(16.1)	82.0(15.0)
p			<0.001	<0.001	<0.001	<0.001
Duration of menopause (years)	<4	197	81.2(17.5)	73.1(29.4)	75.4(18.9)	74.3(20.0)
	4-6	108	72.7(20.6)	70.0(28.7)	72.7(19.8)	71.8(20.0)
	7-10	95	72.2(19.2)	68.3(29.4)	73.8(17.5)	71.8(18.4)
p			<0.001	0.385	0.478	0.412
Chronic diseases	Yes	197	71.8(19.4)	66.2(29.7)	70.6(19.1)	68.1(20.1)
	No	203	81.7(17.8)	75.9(28.0)	78.0(17.3)	77.9(18.0)
p			<0.001	0.001	<0.001	<0.001

Values are expressed as mean (SD).

Table 3. Multivariate predictors of different aspects of health-related quality of life among menopausal women (n = 400)

Characteristics		Subscales of SF36			
		Physical Functioning	General Health	Mental Health	Vitality
Age (per 1 year)		-1.5 (-2.3-(-0.7)) ‡	-0.3 (-1.6- 1.0)	-0.8 (-1.6- 0.1)	-0.7 (-1.6- 0.2)
Education	Illiterate	Referent	Referent	Referent	Referent
	Literate	3.3 (-0.3-6.8)	3.9 (-1.9-9.6)	-1.1 (-4.8-2.6)	1.1 (-2.6-4.8)
Employment status	Housewife	Referent	Referent	Referent	Referent
	Employed	6.2(-1.3-13.7)	6.2 (-5.9-18.2)	4.9(-2.8-12.7)	7.1(-0.6-15.0)
Household income	Insufficient	Referent	Referent	Referent	Referent
	Partly sufficient	6.9 (3.4-10.5)‡	9.2 (3.6-14.9) †	4.2 (0.5-7.8) *	7.2 (3.5-10.8)‡
	sufficient	5.9 (-0.2-12.0)	14.9 (5.0-24.7) †	9.8 (3.5-16.1) *	11.5 (5.1-17.8)‡
Divorced or widowed	Yes	Referent	Referent	Referent	Referent
	No	9.0 (1.6-16.6)*	15.3 (3.3-27.4)*	8.5 (0.8-16.2) *	11.7 (3.9-19.5)‡
No. of children (per 1 child)		-0.5 (-1.4-0.3)	-0.2 (-1.7-1.2)	-0.7 (-1.6-0.2)	-0.6 (-1.6-0.3)
Vasomotor symptoms	Yes	Referent	Referent	Referent	Referent
	No	8.5 (4.7-12.3)‡	16.3 (10.2-22.3)‡	10.6 (6.5-14.3)‡	10.4 (6.5-14.3)‡
Postmenopause duration (per 1 year)		0.4 (-1.2-0.5)	-0.5 (-1.9-0.8)	0.3 (-0.6-1.1)	0.1 (-0.8-0.9)
Chronic diseases	Yes	Referent	Referent	Referent	Referent
	No	7.9 (4.5-11.3)‡	7.7 (2.2-13.0) *	5.2 (2.3-9.3)‡	7.9 (4.4-11.4)‡
Adjusted R^2		0.24	0.15	0.15	0.21

Data is expressed as beta coefficient (95% confidence interval), * $p < 0.05$; † $p < 0.01$; ‡ $p < 0.001$

income negatively affected all 4 dimensions of quality of life. Aging decreased the mean scores of all 4 dimensions, but the reduction was only significant in physical functioning. In contrast, job, education, and duration of menopause had no significant effects on scores of quality of life (Table 3)

According to linear regression analysis, all variables affecting quality of life could explain 24%, 15%, 15%, and 21% of the variance of quality of life among postmenopausal women in the 4 dimensions of physical functioning, general health, mental health, and vitality, respectively (Table 3).

Discussion

There were no substantial differences between scores of the 4 assessed dimensions of quality of life. However, the highest and lowest scores related to physical functioning and general health dimensions, respectively. These findings are consistent with the results

of a study by Montazeri et al. on general population in Tehran (Iran).[19]

According to the results of this study, insufficient household income, having vasomotor symptoms or chronic diseases, and being divorced or widowed were predictors for all 4 dimensions of quality of life. Aging on the other hand, was associated only with decreased physical functioning.

Women with insufficient household income had lower quality of life than other participants. Previous studies have also indicated low socioeconomic status of the family to be associated with reduced quality of life.[15,22] Abedzadeh et al. also reported higher family income to improve quality of life of postmenopausal women.[23] Hemingway et al. suggested lack of access to health care and increased risk of diseases and disabilities from diseases as the possible major causes for lower quality of life among individuals with undesirable socioeconomic status.[22]

About 72% of our participants reported

vasomotor symptoms. Having vasomotor symptoms was one of the predicting factors of reduced quality of life in postmenopausal women. Similar results have been reported in France.[24] Vasomotor symptoms would probably reduce quality of life of individuals by affecting sleep quality and sexual and marital relations.[25]

We found chronic diseases such as diabetes and hypertension to be predictors of reduced quality of life. These diseases therefore could predict quality of life in postmenopausal women. Likewise, in Bandar Abbas (Iran), Aghamolaei et al. suggested these two factors to be among the strong predictors of quality of life.[18]

History of divorce and death of the spouse were other predictors of low quality of life. In England, Kuh et al. showed that divorce or loss of spouse will impact on the mental health of postmenopausal women and that women with failure in life are less relaxed.[26] Similarly, Ehsanpour et al. reported that women without a history of divorce and with less anxiety in life had better quality of life.[17] Loss of spouse and other tensions reduce comfort and can in turn reduce the quality of life.[27]

Although in this study mean scores of different dimensions of quality of life were lower in women with duration of post menopause of more than 4 years, this difference was only significant in physical function dimension. Regression analysis showed that longer duration of post menopause was not an appropriate predictor of quality of life. Therefore, lower quality of life among women with duration of post menopause of more than 4 years could probably be the result of other factors such as aging or the presence of chronic diseases. While Nelson et al.[2] in their review and Khaledian[13] in his study in Tehran (Iran) failed to establish relations between dimensions of quality of life and duration of menopause, Nisar and Ahmed Sohoo evaluated rural women of Pakistan and found longer duration of post menopause to be associated with lower scores of quality of life.[4] Such differences

might have been caused by various factors such as race, genetics, sociocultural factors, area of the study (rural), and age range of the participants. People's perceptions and attitudes toward menopause, and responsibilities and workload of individuals in different parts of the world may also be effective in this regard.[3,28]

In this study, literate women had higher (although not statistically significant) quality of life compared to illiterate subjects. A study by Skevington in 23 countries showed that the relation between literacy and quality of life is affected by culture. In other words, women in developed societies had much higher score of quality of life compared to those in developing societies. Women with more education have greater access to information resources and greater awareness which might be the reason for experiencing fewer problems and better quality of life.[29]

According to our findings, higher ages were associated with lower scores of quality of life. However, this relation was only significant in physical functioning dimension. Some studies in Bandarabbas (Iran)[18], France[24], also a study in 23 countries of the world[29] have reported age as a predictor of reduced quality of life. In contrast, in Chile, Blumel et al. could not find a significant relation between aging and low quality of life.[30]

Abedzadeh et al.[23] and Blumel et al.[30] believed that increased number of children reduced quality of life of women. Fodor and Redai suggested higher number of children could increase parental stress and responsibility as well as financial problems.[31] On the contrary, the results of linear regression analysis in the present study did not show a significant relation between the number of children and quality of life. The culture of the society under study and the interest in having more children could have been responsible for this difference.

Working women obtained higher scores of quality of life compared to housewives, but this difference was not significant. Abedzadeh et al. reported that although

working women had better quality of life, working could not be a predictor of quality of life.[23] Fodor and Redai stated that people's perceptions towards their job, workplace stress, and working hours could be related with quality of life. Therefore, working is not solely effective on improving quality of life.[31]

Since this study was a population-based study, the results of this research can be generalized at least in the city. Other strengths of this study were having appropriate sample size and using a standard quality of life questionnaire (SF-36). Moreover, no study has evaluated a population with the characteristics of our participants. Different factors such as culture, socioeconomic status, residency, ethnicity, and people's perceptions towards menopause can impact on quality of life of post-menopausal women.[4,10] While we studied a group with low socioeconomic status, other factors could have also been effective. Since we did not assess all the effective factors, the factors assessed in this study could predict only 14-23% of variance of quality of life score among postmenopausal women.

On the other hand, since this was a cross-sectional study, we had no information about quality of life of the participants during their premenopausal period. Moreover, we did not include a control group. Therefore, further studies with cohort design or a control group are recommended to compare quality of life between postmenopausal and premenopausal women from different communities with different cultures.

In near future, middle-aged and post-menopausal women will constitute a large proportion of Iranian female population. Since providing necessary training for postmenopausal women before and after menopause can have a significant impact on promoting their quality of life, [32] the results of this study can be used to design interventions to provide Iranian women, especially high risk individuals, women with chronic diseases and vasomotor symptoms, and families with low education and income, with trainings for promoting quality of life after menopause.

Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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