




# The Benefits of Planned Education for Women with Hearing Impairments on the Symptoms in the Climacteric Period

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## Abstract

**Background:** The climacteric period is a stage that includes premenopausal, menopausal, and postmenopausal periods and in which women experience emotional, physical, intellectual, social, and sexual changes. It is stated that women with hearing impairments have insufficient knowledge about the climacteric period. The aim of the study was to investigate the effects of planned education for women with hearing impairments on the symptoms in the climacteric period.

**Methods:** Data were collected from 106 hearing-impaired women by using the women's descriptive characteristics questionnaire and the Menopause Rating Scale. After the data collection phase, the planned education was given to women by using Turkish sign language. Three months after the education phase, climacteric symptoms were re-evaluated with the Menopause Rating Scale.

**Results:** Hot flashes, sleep problems, nervousness, apprehension/concern, physical, and mental fatigue mean scores decreased after the education. The mean score of the somatic (before education:  $3.5 \pm 3.2$ , after education:  $3.0 \pm 3.0$ ), psychological (before education:  $3.0 \pm 3.6$ , after education:  $2.2 \pm 2.9$ ), and the total Menopause Rating Scale (before education:  $7.3 \pm 6.8$ , after education:  $6.2 \pm 6.9$ ) were determined significantly lower after the education.

**Conclusion:** It was determined that the education given to women with hearing impairments reduced the severity of symptoms experienced in the climacteric period.

**Keywords:** Hearing disorders, climacteric, menopause

## Introduction

The climacteric period that includes premenopausal, menopausal, and postmenopausal periods is important in terms of decreasing ovarian function and fertility in women's life.<sup>1-3</sup> In this period, women experience emotional, physical, intellectual, social, and sexual changes.<sup>2,4</sup> The most common symptoms and problems include vasomotor and cardiovascular symptoms, gastro-intestinal changes, leukomotor system problems, atrophic changes in the sexual organs, skin changes, neuro-psychic symptoms, psychiatric symptoms, and weight gain, and these symptoms reduce the quality of life of women in climacteric period.<sup>1,2,5-7</sup> Menopause is a natural part of aging that usually occurs between 45 and 55 years of age.<sup>8,9</sup> According to the Turkey Demographic and Health Survey (2018), 45% of women in the age group of 48-49 experienced menopause.<sup>10</sup> Turkey Statistical Institute (TurkStat) (2018) stated that life expectancy is 80.7 years for women. Parallel to the increase in the average life expectancy, women will spend about 25-30 years in the post-menopausal period.<sup>11</sup> Therefore, it is very important to determine the problems of women in the menopause period for increasing the quality of life.

Hearing disability is a state of hearing loss in both ears, and the rates worldwide are between 3.2% and 12%.<sup>12,13</sup> In Turkey, 5.9% of people have hearing and 0.2% of them have speech disabilities.<sup>14</sup> It is known that people with disabilities have problems in the fields of politics, economy, interpersonal communication, social discrimination, physical accessibility, working life, education, and health services. Women with hearing disabilities may face many problems during menopause as well as in many areas related to the health field. The women cannot obtain information about the menopausal period because of some communication problems with health professionals and many of them do not know the sign language sufficiently.<sup>15</sup>

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There were many studies evaluating climacteric symptom<sup>1,5,6,16</sup> and the effect of education on physical and psychological problems during the climacteric period in women without disabilities.<sup>7,17,18</sup> Only one review evaluated symptoms perceived by women with disabilities during the climacteric and menopausal period. In this study, it was pointed that there were no studies about this issue in women with hearing disabilities.<sup>19</sup>

As can be seen in the literature there were no published studies for determining climacteric symptoms or evaluating the effect of giving education on climacteric symptoms to women with hearing impairments. At the planning stage of the research, a gap among women with hearing impairments was noticed about these issues. The opportunities for women with hearing impairments to get face-to-face education from health professionals by sign language are very limited. For this reason, the second and third researchers of this study completed the Turkish sign language interpreting training and contacted these women.

Based on these important points, the study was planned to investigate the effects of planned education for women with hearing impairments on the symptoms in the climacteric period with sign language by face-to-face training.

## Methods

### Study Design

The research was a longitudinal study with experimental group.

### Hypothesis of the Study

H<sub>0</sub>: Planned education given to women with hearing impairments has no effect on the Menopause Rating Scale total score.

H<sub>1</sub>: Planned education given to women with hearing impairments has an effect on the Menopause Rating Scale total score.

### Sample

This study was conducted between July 15, 2018, and December 31, 2018, with 106 women. The universe of the study consisted of 120 women with hearing impairments who were registered in Hearing Impaired Association in İzmir and Manisa cities, which are located in the western region of Turkey. No sample selection was made in the study as it was aimed to reach all women. Women who were under 40 years or older than 65 years, women who use hormone replacement therapy for reducing climacteric symptoms, who did not know Turkish Sign Language, and who did not want to participate in the study were excluded. Between the dates, 6 women did not want to participate in the study and 8 women were under 40 or 65 years. Thus, the study included 106 women who answered all the questionnaires.

### Instruments

The data collection tool consisted of 2 parts. The first part included a questionnaire about the descriptive characteristics of women. The second part included Menopause Rating Scale (MRS) which was developed by Schneider et al.<sup>21</sup> and adapted for Turkish use by Gürkan<sup>20</sup> and the Cronbach's alpha coefficient is 0.84. The scale consists of 11 questions for the presence and severity of menopausal symptoms and 3 subscales (somatic, psychological, and urogenital). Each item can be graded as 0 (not present), 1 (mild), 2 (moderate), 3 (severe), or 4 (very severe). The lowest score on the scale is 0, and the highest score is 44. A higher total score means

that the intensity of the complaints is higher and the quality of life is affected negatively.<sup>20,21</sup>

### Data Collection

Women with hearing impairments were invited to the association. After data collection, planned education was given to the women using a face-to-face interview with sign language. The education session for each woman took approximately 1 hour. The data collection and education phase was administered by the second author. After the education phase, a book and CD that included the education were given to the women for remembering the education. The book was written with both text and photos in Turkish Sign Language by the authors to draw attention to the importance of this, to inform them, and to raise awareness about problems and solutions that may occur during the climacteric period. Three months after the education phase, women were re-invited to associations and climacteric symptoms were re-evaluated with the MRS.

### Implementation of Education Program

The education session included solutions for the symptoms and problems in the climacteric period. The second and third researchers had completed sign language interpreting training. The second researcher of this study who has a master degree in gynecology and obstetric nursing was able to give the education about the climacteric period by sign language as a nurse. The third researcher who has a master's degree in Sport Faculty Recreation department has been an international sign language interpreter for several years and has been giving sign language lessons in a university in Turkey.

During the education session, simple sentences were used as much as possible as many words in the field of health were not found in sign language. For example, instead of menopause, "female menstruation is finished" and M is used because there is no sign of menopause in sign language.

During the education session, the researcher used a range of techniques including oral presentation, questions and answers, discussion, and demonstration. The location of female reproductive organs was shown by the Advanced Pelvic Examination and Gynecological Simulator model, and the change in the structure of the reproductive organs during the menopausal period was demonstrated by the Postmenopausal Module. In addition, birth control methods, such as how to use a condom, and how to insert an intrauterine device was shown with the model of Female Pelvic Organs.

In order to draw attention to the importance of this period, to increase the awareness about the problems that can be experienced in the climacteric period, and solution proposals, a training presentation was prepared. The presentation includes natural and surgical menopause, the factors affecting the age of menopause, the symptoms of the menopause period, and the solution proposals for the problems experienced in the menopausal period. After the training, a book that was illustrated with both writing and signing languages including the information that took place in the presentation was given to the women with hearing impairments.

The Kegel exercise was shown with the Pilates ball and circle and was explained to women with sign language by the third author. After showing the Kegel exercise, women tried to do it. We also give the women a CD, which was prepared professionally, that included the

exercise. During the education sessions, women were encouraged to ask questions about the climacteric period. Three months after the session, the MRS was administered by the third author.

### Statistical Analysis

The statistical analysis was performed using IBM Statistical Package for the Social Sciences Statistics 20 Core System for Windows Version 20.0 (IBM Corp., Armonk, NY, USA) Basic descriptive characteristics were analyzed using frequency distributions. After the Kolmogorov-Smirnov test that was used for the comparison of a standard normal distribution, it was seen that the groups were not homogeneous (Kolmogorov Smirnov =0.142,  $df=106$ ,  $P < .000$ ). For this reason, Mann-Whitney  $U$  and Kruskal Wallis tests were used to determine the relationship between the characteristics of the women and MRS.  $t$ -test in dependent groups was used for evaluating the relationship between the total score of the MRS before and after 3 months of education. A  $P$  level of  $<.05$  was considered as statistically significant.

### Ethical Considerations

The Health Sciences Ethics Committee of Manisa Celal Bayar University approved the study on October 11, 2017 (Number: 20.478.486). The study protocol and consent procedure were approved by the Hearing Impaired Association in Izmir and Manisa. Written informed consent was obtained from the women who agreed to participate in the study. The permission for using the MRS was approved by Gürkan<sup>20</sup>.

## Results

### Characteristics of Women

In this study, the mean ages of women and their husbands were  $50.6 \pm 7.6$  (min: 40, max: 65) and  $54.4 \pm 9.5$  (min: 40, max: 79), respectively. Overall, 52.8% of women were between the ages of 40 and 50 years, 52.8% of them graduated from primary school, 66.0% were unemployed, 92.5% had health insurance, and 50.0% of women were overweight. Of the women, 63.2% stated that they did not receive any information about menopause, 62.3% were in the menopausal period, and all women had not used hormone replacement treatment (Table 1).

### Relationship Between Women's Characteristics and the Menopause Rating Scale Scores Before and After Education

Before and after education, the mean total score of MRS was found statistically higher in the 51-65 age group of women than the 40-50 age group of women ( $P < .001$ ). Before education, the total score of MRS was statistically higher in women who were in the illiterate and literate group ( $10.8 \pm 7.3$ ) than in women who were graduated from primary school ( $6.4 \pm 6.0$ ) ( $P=.031$ ). After the education, literate and illiterate women ( $10.9 \pm 9.4$ ) had higher scores than the women who had primary school education ( $4.7 \pm 4.5$ ) and secondary school education ( $5.5 \pm 7.2$ ) ( $P=.017$ ). Women who were not married had statistically higher scores from MRS than married women before and after education ( $P=.001$ ). There was a statistically significant relationship between women's husbands' age and education group and the MRS scores before and after education. Before the education, the mean score of the MRS was statistically higher in women without health insurance ( $12.8 \pm 5.4$ ) than that of women with health insurance ( $6.9 \pm 6.8$ ) ( $P=.011$ ), in women who were overweight ( $9.0 \pm 7.5$ ) than the women who were normal weight ( $4.5 \pm 5.5$ ) ( $P=.041$ ), and in women who had a disease ( $13.0 \pm 7.2$ ) than those who did not have ( $5.8 \pm$

$5.9$ ) ( $P < .001$ ). The MRS mean scores were found lower in healthily nourished women than the those of women who were not healthily nourished before ( $P=.003$ ) and after the education ( $P=.005$ ).

Women with the menopausal period had higher score from the MRS (before education:  $9.4 \pm 6.5$ , after education:  $7.9 \pm 6.4$ ) than that of women without the menopausal period (before education:  $3.9 \pm 5.9$ , after education:  $3.3 \pm 6.8$ ) ( $P < .001$ ). The total mean score of MRS was found to decrease from  $9.3 \pm 6.6$  to  $7.7 \pm 6.2$  in women entering natural menopause after education ( $P < .001$ ). As can be seen from Table 1, after education, the MRS mean score decreased in all groups of women with age, marital status, condition of physical disease, nutrition and menopausal status and health insurance. A decreasing score of the MRS was seen in women who graduated from primary and secondary school.

In this study, there was no relationship between the mean total score of MRS and sub-dimensions and some variables (family type, smoking and using alcohol, doing sports, having a child, and women who got information about menopause before the education) (data not shown).

### Relationship Between Women's Characteristics and Subscale Scores of the Menopause Rating Scale Before and After Education

As presented in Table 2, the mean score of the somatic, physiologic, and urogenital subscales was found higher in women with advanced age before and after the education. The mean scores of somatic and physiologic subscales were statistically higher in women who were not married, in women who had a chronic disease, who were not healthily nourished, and who were in the menopausal period. Before education, women who entered menopause naturally and women with low-income status had high mean scores of the physiologic subscale. The urogenital subscale mean score was found statistically high in employed women and women who entered menopause surgically. The mean scores of somatic subscales were found higher in women who entered menopause naturally. After education, the somatic and physiologic sub-score decreased in all groups of women with age, nutrition status, and menopausal status, and the mean score of physiologic subscale was decreased in all groups of women with education level, marital status, age of husbands, status of health insurance, and type of menopause (Table 2).

### Relationship Between the Menopause Rating Scale Items Before and After Education

In this study, hot flashes (57.5%), sleep problems (48.5%), and irritability (41.5%) were the most frequently experienced climacteric period symptoms by women with hearing impairments before the education (data not shown).

When the mean scores of the MRS items before and after education were compared, hot flashes ( $P < .001$ ), sleep problems ( $P=.016$ ), irritability ( $P=.027$ ), anxiety ( $P=.012$ ), physical and mental exhaustion items ( $P=.002$ ) were found statistically lower after education (Table 3).

### Relationship Between the Total and Subscales Scores of Menopause Rating Scale Before and After Education

It can be seen in Table 4 that there was a statistically significant difference between the total scores of MRS (before education:  $7.3 \pm 6.8$ , after education:  $6.2 \pm 6.9$ ) and somatic (before education:  $3.5 \pm 3.2$ ,

Table 1. Relationship Between Women's Characteristics and the Total Score of Menopause Rating Scale Before and After Education

Characteristics	N (%)	Total Score of the Menopause Rating Scale			
		Before Education		After Education	
		Mean ± SD	P	Mean ± SD	P
<b>Age of women**</b>			<b>&lt;.001</b>		<b>&lt;.001</b>
40-50 age	56 (52.8)	5.4 ± 6.7		4.6 ± 7.2	
51-65 age	50 (47.2)	9.4 ± 6.4		8.0 ± 6.2	
<b>Education status of women***</b>			<b>.031</b>		<b>.017</b>
Illiterate and literate (a)			a>b		a>b, a>c
Primary school (b)	22 (20.8)	10.8 ± 7.3		10.9 ± 9.4	
Secondary school and upper (c)	56 (52.8)	6.4 ± 6.0		4.7 ± 4.5	
	28 (26.4)	6.4 ± 7.4		5.5 ± 7.2	
<b>Marital status**</b>			<b>.001</b>		<b>.001</b>
Married	94 (88.7)	6.6 ± 6.8		12.3 ± 8.2	
Not married	12 (11.3)	12.8 ± 4.5			
<b>Age of husbands***</b>			<b>.001</b>		<b>.001</b>
Had no husband (a)	12 (11.3)	12.8 ± 4.5	a>b,c>b	12.3 ± 8.2	a>b,a>c
40-50 age (b)	42 (39.6)	4.0 ± 5.5		3.6 ± 6.8	
≥51 age (c)	52 (49.1)	8.8 ± 7.0		6.8 ± 5.6	
<b>Education status of husbands***</b>			<b>.002</b>		<b>.001</b>
Had no husband (a)		12.8 ± 4.5	a>c,a>d	12.3 ± 8.2	a>c,a>d,b>c,b>d
Illiterate and literate (b)	12 (11.3)	8.9 ± 6.6		12.6 ± 11.2	
Primary school (c)	9 (8.5)	7.1 ± 6.8		5.1 ± 5.4	
Secondary school and upper (d)	54 (50.9)	5.1 ± 6.6		3.7 ± 4.6	
	31 (29.3)				
<b>Perceived income level**</b>			<b>.075</b>		<b>.273</b>
Low income	8 (7.5)	10.5 ± 5.4		7.8 ± 6.8	
Middle income	98 (92.5)	7.1 ± 6.9		6.1 ± 6.9	
<b>Employment status of women**</b>			<b>.732</b>		<b>.97</b>
Employed		7.1 ± 7.1		6.8 ± 8.4	
Unemployed	36 (34.0)	7.4 ± 6.7		5.8 ± 6.0	
	70 (66.0)				
<b>Health insurance**</b>			<b>.011</b>		<b>.007</b>
Yes	98 (92.5)	6.9 ± 6.8		5.6 ± 6.4	
No	8 (7.5)	12.8 ± 5.4		13.8 ± 8.7	
<b>Body mass index***</b>			<b>.041</b>		<b>.043</b>
Underweight(a)	3 (2.8)	6.3 ± 7.8	c>b	15.3 ± 13.3	a>b
Normal weight (b)	31 (29.3)	4.5 ± 5.5		4.0 ± 6.6	
Overweight (c)	53 (50.0)	9.0 ± 7.5		6.6 ± 6.3	
Obesity (d)	19 (17.9)	7.2 ± 5.4		7.1 ± 6.7	

Table 1. Relationship Between Women's Characteristics and the Total Score of Menopause Rating Scale Before and After Education (*Continued*)

Characteristics	N (%)	Total Score of the Menopause Rating Scale			
		Before Education		After Education	
		Mean ± SD	P	Mean ± SD	P
<b>Condition of physical disease**</b>			<b>.001</b>		<b>.002</b>
Yes		13.0 ± 7.2		9.5 ± 7.1	
No	22 (20.8) 84 (79.2)	5.8 ± 5.9		5.3 ± 6.6	
<b>Nutrition status**</b>			<b>.003</b>		<b>.005</b>
Healthily nourished	96 (90.6)	6.7 ± 6.6		5.5 ± 6.4	
Unhealthily nourished	10 (9.4)	13.3 ± 5.9		12.6 ± 8.2	
<b>Menopausal status**</b>			<b>.001</b>		<b>.001</b>
Menopause	66 (62.3)	9.4 ± 6.5		7.9 ± 6.4	
Not menopause	40 (37.7)	3.9 ± 5.9		3.3 ± 6.8	
<b>Type of menopause***</b>			<b>.001</b>		<b>.001</b>
Not menopause (a)	40 (37.7)	3.9 ± 5.9	c>a	3.3 ± 6.8	c>a
Surgical (b)	4 (3.8)	10.5 ± 6.2		11.5 ± 8.1	
Natural (c)	62 (58.5)	9.3 ± 6.6		7.7 ± 6.2	

\*Significance after Bonferroni correction: No significance (NS).  
 \*\*Mann-Whitney U test  
 \*\*\*Kruskal Wallis test.  
 SD, standard deviation.

after education: 3.0 ± 3.0) and psychological (before education: 3.0 ± 3.6, after education: 2.2 ± 2.9) subscale mean scores ( $p < .001$ ).

## Discussion

In this study, the effects of planned education for women with hearing impairments on the symptoms in the climacteric period were investigated, and it was found that hot flashes (57.5%), sleep problems (48.5%), and irritability (41.5%) were the most frequently experienced symptoms. In studies, the rate of occurrence of hot flashes was 67% in Cambodia,<sup>22</sup> 62% in India,<sup>23</sup> and 82.2% in Turkey.<sup>24</sup> The prevalence of sleep problems in the climacteric period was between 48% and 82.5%.<sup>22,23,25,26</sup> Bladder problems (53.3%), sexual problems (96.7%), physical and mental fatigue (92.5%),<sup>27</sup> irritability and nervousness (82.2%),<sup>24</sup> muscular pain (79.7%),<sup>22</sup> and heart disorders (49%)<sup>25</sup> were other problems.

In the study, before education, the mean total score of MRS was found to be 7.3. The finding was lower than that in other studies, which used the MRS in women who had no disability, such as those conducted in Brazil (18.7),<sup>2</sup> Iran (14.8),<sup>28</sup> and Turkey (between 11.2 and 16.9).<sup>7,24,29-31</sup> In the current study, different perception of symptoms of the women with hearing impairments may be the reason for the lower score from MRS. Another reason may be that the women with hearing impairments may not consider menopausal symptoms as a serious problem or do not apply to the healthcare intuitions before these symptoms become too severe. It has been observed during the data collection that many women with hearing impairments stated that they do not apply sufficiently to the health institutions due to their disability.

In the research, before education, the mean scores of MRS sub-dimensions, somatic, psychological, and urogenital, were found to be 3.5, 3.0, and 0.8, respectively. In a study (n=152 women), which aimed to examine the relationship between women's attitude toward menopause with the MRS somatic, psychological, and urogenital sub-dimensions, the mean scores were found to be 2.9, 9.0, and 5.4, respectively.<sup>32</sup> In another study, before and after the education, the mean scores of MRS sub-dimensions in experimental group, somatic (4.3 and 3.0), psychological (14.6 and 10.4), and urogenital (24.3 and 16.9), were found higher than this study.<sup>7</sup> Only in a study, somatic sub-dimension scores were lower than our study.<sup>32</sup> The population of the studies consists of healthy women without any disability. Because of that reason, the MRS sub-dimension scores might be different.

It appears from the study that the mean scores of hot flashes, sleep problems, irritability, anxiety, physical, and mental fatigue, MRS, somatic and psychological sub-dimensions decreased after education. It can be said that face-to-face education planned with the sign language is beneficial to the women with hearing impairments. The findings were similar to the results of other studies which evaluated the effect of education on women who had no disability. A randomized quasi-experimental study in Sri Lanka reported that the MRS scores were significantly decreased after the education in experimental group.<sup>3</sup> In Sweden, the intervention group experienced a slight reduction in symptoms after group education.<sup>17</sup> A study from Australia reported that anxiety, depression, vasomotor symptoms, and sexual dysfunction scores decreased after education.<sup>18</sup> As seen in the current and previous study findings, the education given in climacteric

Table 2. Relationship Between Women's Characteristics and the Subscales Score of Menopause Rating Scale Before and After Education

Characteristics	Somatic		Psychological Before Education		Psychological After Education		Urogenital Before Education		Urogenital After Education			
	Mean ± SD	p	Mean ± SD	P	Mean ± SD	P	Mean ± SD	P	Mean ± SD	P		
<b>Age of women**</b>												
40-50	2.4 ± 3.0	<b>0.001</b>	2.0 ± 2.8	<b>.001</b>	2.3 ± 3.2	<b>.021</b>	1.8 ± 2.9	<b>.011</b>	0.7 ± 1.3	<b>.021</b>	0.9 ± 2.0	<b>.011</b>
51-65	4.7 ± 2.9		4.1 ± 2.9		3.8 ± 3.9		2.8 ± 2.7		0.9 ± 1.6		1.1 ± 1.9	
<b>Education status of women***</b>												
Illiterate and literate (a)	4.5 ± 3.0		4.6 ± 4.0		5.1 ± 4.7	<b>.033</b>	4.1 ± 3.8	<b>.018</b>	1.1 ± 1.2	<b>.035</b>	2.2 ± 2.8	<b>.003</b>
Primary school (b)	3.2 ± 2.8	.176	2.4 ± 2.2	0.071	2.6 ± 3.3	a>b, a>c	1.8 ± 2.3	a>b, a>c	0.6 ± 1.5	a>b	0.5 ± 1.2	NS*
Secondary school and upper (c)	3.4 ± 4.0		2.8 ± 3.2		2.0 ± 2.6		1.7 ± 2.6		0.9 ± 1.6		0.6 ± 2.0	
<b>Marital status**</b>												
Married	3.1 ± 3.1	<b>.001</b>	2.5 ± 2.6	<b>.001</b>	2.6 ± 3.6	<b>.002</b>	2.0 ± 2.8	<b>.014</b>	0.8 ± 1.5	.986	0.9 ± 1.9	.253
Not married	6.5 ± 2.1		6.8 ± 3.6		5.7 ± 3.2		3.8 ± 2.9		0.7 ± 1.1		1.8 ± 2.6	
<b>Age of husbands***</b>												
Had no husband (a)	6.5 ± 2.1	<b>.001</b>	6.8 ± 3.6	<b>.001</b>	5.7 ± 3.2	<b>.001</b>	3.8 ± 2.9	<b>.002</b>	0.7 ± 1.1		1.8 ± 2.6	
40-50 age (b)	1.6 ± 2.3	a>b,c>b	1.3 ± 2.4	a>b, a>c, c>b	1.7 ± 2.7	a>b	1.5 ± 2.8	a>b	0.7 ± 1.5	0.497	0.8 ± 2.0	0.388
≥51 age (c)	4.4 ± 3.1		3.4 ± 2.3		3.4 ± 4.0		2.5 ± 2.7		0.9 ± 1.6		0.9 ± 1.7	
<b>Education status of husbands***</b>												
Had no husband (a)	6.5 ± 2.1		6.8 ± 3.6		5.7 ± 3.2		3.8 ± 2.9		0.7 ± 1.1		1.8 ± 2.6	
Illiterate and literate (b)	3.6 ± 2.8	<b>.001</b>	4.2 ± 4.4	<b>.001</b>	4.1 ± 4.3	<b>.024</b>	5.1 ± 4.0	<b>.004</b>	1.2 ± 1.0	<b>.007</b>	3.2 ± 3.5	
Primary school (c)	3.4 ± 3.1	a>c,a>d	2.5 ± 2.2	a>c,a>d	2.9 ± 3.6	a>d	1.9 ± 2.6	b>c,b>d	0.8 ± 1.6	b>c,b>d	0.7 ± 1.6	0.131
Secondary school and upper (d)	2.6 ± 3.2		2.0 ± 2.4		1.8 ± 3.0		1.3 ± 2.2		0.8 ± 1.5		0.5 ± 1.1	
<b>Perceived income level**</b>												
Low	3.9 ± 1.6	.456	3.9 ± 3.9	.392	5.9 ± 4.0	<b>.02</b>	2.6 ± 2.4	.375	0.8 ± 0.9	.492	1.3 ± 1.4	.102
Middle	3.5 ± 3.3		2.9 ± 3.0		2.7 ± 3.5		2.2 ± 2.9		0.8 ± 1.5		1.0 ± 2.0	

Table 2. Relationship Between Women's Characteristics and the Subscales Score of Menopause Rating Scale Before and After Education (Continued)

Characteristics	Somatic			Psychological Before Education			Psychological After Education			Urogenital Before Education			Urogenital After Education			
	Mean ± SD	p	Mean ± SD	Mean ± SD	P	Mean ± SD	Mean ± SD	P	Mean ± SD	P	Mean ± SD	P	Mean ± SD	P		
<b>Employment status of women**</b>		.468			.995			.527		.779				.013		.077
Employed	3.4 ± 3.7		3.1 ± 3.5			2.6 ± 3.2			2.3 ± 3.3		1.2 ± 1.5		1.4 ± 2.3			
Unemployed	3.6 ± 2.9		2.9 ± 2.8			3.2 ± 3.8			2.2 ± 2.7		0.6 ± 1.4		0.8 ± 1.8			
<b>Health insurance**</b>		.042			.036			.005		.004				.150		.003
Yes	3.4 ± 3.2		2.8 ± 2.9			2.7 ± 3.5			2.0 ± 2.7		0.8 ± 1.5		3.2 ± 3.3			
No	5.3 ± 1.8		5.4 ± 4.9			6.4 ± 4.2			5.3 ± 2.9		1.1 ± 1.4		0.8 ± 1.7			
<b>Body mass index***</b>		.081			.029			.044		.274				.335		.117
Underweight(a)	2.7 ± 2.5		6.7 ± 6.5	a>b		3.7 ± 5.5	NS*		4.3 ± 4.0		0.0 ± 0.0		4.3 ± 4.5			
Normal weight (b)	2.4 ± 2.6		1.8 ± 2.7			1.7 ± 3.3			1.7 ± 3.0		0.5 ± 0.9		0.5 ± 1.5			
Overweight (c)	4.3 ± 3.6		3.4 ± 2.9			3.7 ± 3.8			2.3 ± 2.7		1.0 ± 1.7		0.9 ± 1.7			
Obesity (d)	3.3 ± 2.4		3.2 ± 2.7			2.9 ± 3.2			2.5 ± 3.0		0.9 ± 1.7		1.4 ± 2.4			
<b>Condition of physical disease**</b>					.002			.002		.009				.063		.057
Yes	6.5 ± 3.5	.001	2.5 ± 2.8			5.3 ± 4.2			1.9 ± 2.7		0.7 ± 1.4		0.9 ± 1.9			
No	2.7 ± 2.6					2.4 ± 3.2										
<b>Nutrition status**</b>		.031			.028			.001		.006				.241		.011
Healthily nourished	3.3 ± 3.2		2.8 ± 2.9			2.6 ± 3.4			2.0 ± 2.7		0.8 ± 1.4		0.8 ± 1.7			
Unhealthily nourished	5.2 ± 2.1		5.0 ± 3.7			6.8 ± 4.0			4.7 ± 3.0		1.3 ± 1.8		2.9 ± 3.2			
<b>Having child**</b>		.115			.155			.564		.2				.166		.706
Yes	3.6 ± 3.1		3.0 ± 2.8			3.0 ± 3.6			2.3 ± 2.8		0.9 ± 1.5		1.0 ± 1.9			
No	2.5 ± 3.6		2.7 ± 5.4			2.7 ± 3.8			1.5 ± 3.1		0.3 ± 0.6		1.0 ± 2.2			
<b>Menopausal status**</b>		.001			.001			.002		.001				.162		.192
Menopause	4.7 ± 3.0		4.0 ± 2.9			3.7 ± 3.8			2.8 ± 2.8		1.0 ± 1.6		1.1 ± 1.9			
Not menopause	1.6 ± 2.5		1.2 ± 2.4			1.8 ± 3.0			1.4 ± 2.8		0.6 ± 1.3		0.7 ± 2.0			
<b>Type of menopause***</b>																
Not menopause (a)	1.6 ± 2.5		1.2 ± 2.4			1.8 ± 3.0			1.4 ± 2.8		0.6 ± 1.3		0.7 ± 2.0			
Surgical (b)	4.3 ± 1.3	.001	5.3 ± 2.6	b>a	.001	3.5 ± 3.4	.008		3.5 ± 3.0	.004	2.8 ± 2.5		2.8 ± 3.2	.046		
Natural (c)	4.7 ± 3.1	c>a	4.0 ± 2.9	b>a	.001	3.7 ± 3.9	c>a		2.7 ± 2.8	NS*	0.8 ± 1.5	b>a,b>c	1.0 ± 1.8			.25

\*Significance after Bonferroni correction; No significance (NS).

\*\*Mann-Whitney U test.

\*\*\*Kruskal Wallis test.

SD, standard deviation.

Table 3. Relationship Between Menopause Rating Scale Questionnaires Items Before and After Education

Number	The Menopause Rating Scale Questionnaires	Before Education		After Education		Test
		Mean $\pm$ SD	Median (Min-Max)	Mean $\pm$ SD	Median (Min-Max)	
1	Hot flushes, sweating (episodes of sweating)	1.3 $\pm$ 1.4	1.0000 (0.00-4.00)	1.1 $\pm$ 1.2	1.0000 (0.00-4.00)	Z=-3.522 P<.001
2	Heart discomfort (unusual awareness of heart beat, heart skipping, heart racing, tightness)	0.5 $\pm$ 1.0	0.0000 (0.00-4.00)	0.5 $\pm$ 0.9	0.0000 (0.00-4.00)	Z=-0.049 P=.961
3	Sleep problems (difficulty in falling asleep, difficulty in sleeping through, waking up early)	1.1 $\pm$ 1.1	1.0000 (0.00-4.00)	0.9 $\pm$ 1.0	1.0000 (0.00-4.00)	Z=-2.405 P=.016
4	Depressive mood (feeling down, sad, on the verge of tears, lack of drive, mood swings)	0.7 $\pm$ 1.0	0.0000 (0.00-4.00)	0.6 $\pm$ 1.0	0.0000 (0.00-4.00)	Z=-1.137 P=.256
5	Irritability (feeling nervous, inner tension, feeling aggressive)	0.9 $\pm$ 1.2	0.0000 (0.00-4.00)	0.7 $\pm$ 1.1	0.0000 (0.00-4.00)	Z=-2.211 P=.027
6	Anxiety (inner restlessness, feeling panicky)	0.6 $\pm$ 1.1	0.0000 (0.00-4.00)	0.4 $\pm$ 0.8	0.0000 (0.00-4.00)	Z=-2.517 P=.012
7	Physical and mental exhaustion (general decrease in performance, impaired memory, decrease in concentration, forgetfulness)	0.8 $\pm$ 1.1	0.0000 (0.00-4.00)	0.5 $\pm$ 0.8	0.0000 (0.00-4.00)	Z=-3.105 P=.002
8	Sexual problems (change in sexual desire, in sexual activity and satisfaction)	0.3 $\pm$ 0.6	0.0000 (0.00-2.00)	0.4 $\pm$ 0.9	0.0000 (0.00-4.00)	Z=-0.412 P=.680
9	Bladder problems (difficulty in urinating, increased need to urinate, bladder incontinence)	0.3 $\pm$ 0.6	0.0000 (0.00-3.00)	0.3 $\pm$ 0.7	0.0000 (0.00-4.00)	Z=-0.350 P=.726
10	Dryness of vagina (sensation of dryness or burning in the vagina, difficulty with sexual intercourse)	0.2 $\pm$ 0.6	0.0000 (0.00-3.00)	0.3 $\pm$ 0.7	0.0000 (0.00-3.00)	Z=-1.351 P=.177
11	Joint and muscular discomfort (pain in the joints, rheumatoid complaints)	0.6 $\pm$ 1.1	0.0000 (0.00-4.00)	0.4 $\pm$ 0.9	0.0000 (0.00-4.00)	Z=-1.919 P=.055

Z, Wilcoxon test. SD, standard deviation.

period is beneficial for improving the health of women, and it can be used as a suitable strategy for coping with menopausal symptoms.

In the present study, women of advanced age, who were literate and illiterate, who were unmarried, women who had no partner, who had no health insurance, who had a disease, and who were not healthily nourished had high scores of the MRS, psychological, somatic,

and urogenital sub-dimensions before the education. The scores decreased after the education. Hence, the education programs and counseling services provided to women with hearing impairments with low socioeconomic status were very important. As is known, women with hearing disabilities are considered as disadvantaged groups because they are both women and disabled. Therefore, special attention should be given to these women for counseling on health,

Table 4. Relationship Between the Total and Subscale Scores of Menopause Rating Scale Before and After Education

Subscales of Menopause Rating Scale	Before Education		After Education		Test
	Mean $\pm$ SD	Median (Min-Max)	Mean $\pm$ SD	Median (Min-Max)	
Somatic	3.5 $\pm$ 3.2	3.0000 (0.00-14.00)	3.0 $\pm$ 3.0	2.000 (0.00-13.00)	Z=-3.863 P<.001
Psychological	3.0 $\pm$ 3.6	1.5000 (0.00-13.00)	2.2 $\pm$ 2.9	1.0000 (0.00-13.00)	Z=-3.611 P<.001
Urogenital	0.8 $\pm$ 1.5	0.0000 (0.00-6.00)	1.0 $\pm$ 2.0	0.0000 (0.00-9.00)	Z=-0.447 P=.655
<b>Total score of Menopause Rating Scale</b>	7.3 $\pm$ 6.8	6.0000 (0.00-26.00)	6.2 $\pm$ 6.9	4.0000 (0.00-34.00)	Z=-3.810 P<.001

Z, Wilcoxon Test; SD, standard deviation.



early diagnosis, and treatment. Consistent with the study's findings, previous studies pointed out that the mean scores of somatic,<sup>22</sup> urogenital,<sup>31</sup> and psychological sub-dimensions are significantly higher in women with advanced age,<sup>22,33,34</sup> and MRS total and sub-scale mean scores were found to be higher in women who have under-5 years of education<sup>33</sup> and who were not literate than women with primary or higher education.<sup>34</sup>

In this study, before education, somatic, psychological, and urogenital mean scores were found to be significantly higher in women who entered natural menopause and somatic and psychological mean scores decreased after education. In this study, there was no statistically significant difference between the status of getting information about the climacteric period and MRS total and sub-score before the study. The reason for the finding is that insufficient number of health professionals know sign language and the training program for these women remains limited.

### Study Limitations

This study had some limitations. First, the sample of this study included women with hearing impairments in the climacteric period in the west region of Turkey and may not be generalizable to the country. Secondly, there were no any published studies about the issue in women with hearing impairments. Because of that, in this article, the discussion section was written with the studies that were conducted in with women without disabilities. Future studies should focus on these groups of women for developing health educational programs.

### Conclusion

In conclusion, the planned education for women with hearing impairments on the symptoms in the climacteric period was found beneficial. The reason of this situation could be the fact that giving face-to-face education to the women with hearing impairments by using sign language would be more beneficial to decrease the climacteric symptoms. It is recommended that giving education about climacteric period to the women with hearing impairments by nurses could be beneficial. The education program can be arranged according to the women with hearing impairments, and the education materials (brochure and video, etc.) must be prepared by using sign language. Hence, nurses who could use sign language should give the education widespread for women with hearing disabilities.

**Ethics Committee Approval:** Ethics committee approval was received for this study from The Health Sciences Ethics Committee of Manisa Celal Bayar University (Date: October 11, 2017, Number: 20.478.486).

**Informed Consent:** Written informed consent was obtained from the women with hearing impairments who participated in this study.

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