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ORIGINAL ARTICLE

Effectiveness of a stress management program to enhance perimenopausal women's ability to cope with stress

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Abstract

Aim: To evaluate the effectiveness of a stress management program to enhance the ability to cope with stress in perimenopausal women.

Methods: In this quasi-experimental design, a stress management program was provided to an experimental group ($n = 55$), while a control group ($n = 42$) was given an informational pamphlet. The stress management program included a short lecture, group discussion, and hands-on training in 2 h sessions once a week for 3 weeks. Participants were recruited through a public announcement. Data were collected before and after the intervention, and 1 month following the intervention. The ability to cope with stress was the primary outcome, while psychological well-being and relief of symptoms were the secondary outcomes. The primary purpose of this program is to enhance the ability to cope with stress. Therefore, the aspects of knowledge, coping flexibility, and manageability were measured in the resultant ability to cope with stress.

Results: Compared to the control group, knowledge in the experimental group improved positively as the primary outcome ($P < 0.01$). Changes in coping flexibility were demonstrated within the experimental group ($P < 0.05$). A comparison between groups for the secondary outcome of psychological well-being showed that personal growth ($P < 0.05$) and happiness ($P < 0.01$) significantly improved in the experimental group. In addition, the secondary outcome of relief of symptoms indicated not improved.

Conclusion: Results suggest that the stress management program has the potential to boost perimenopausal women's ability to cope with stress and improve their psychological well-being.

Key words: care program, perimenopause, quasi-experimental design, stress coping, stress management.

BACKGROUND

Due to the recent aging population and a steep rise in medical fees, maintaining health and preventing illness after menopause is becoming an important health issue in Japan. The menopause is a turning point and a period of great physical and emotional change in a woman's life (Lock, 2005). During this period of transition, it is important for a woman to examine how she has been controlling her own health and to create a way of managing health that is most appropriate for her. Developing that health management will also have a positive impact on her health in later years (Wilmoth, 1996).

Reduced endocrine function and stress triggered by psychosocial factors are largely responsible for symptoms of menopause (The Japan Society for Menopause and Women's Health, 2014). Those factors faced by menopausal women are a mix of unavoidable life events including caring for parents, a child's search for employment, and an accumulation of daily problems, such as balancing diverse symptoms and lifestyles (Kamo, 2006). The menopausal experience is a complicated phenomenon with substantial individual variation. Therefore, it is important for a perimenopausal woman in a stressful environment to better understand the stressful situation in which she finds herself and cultivate her ability to cope by flexibly responding. Several

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researchers noted that if coping was used flexibly to suit the situation then the stress reaction was reduced, anxiety and depression were relieved, and well-being was improved (Cheng, 2001; Kato, 2001; Mino & Kanemitsu, 2004). Hence, this research focuses not on the reduction of the phenomenon of stress, but rather on the ability to cope with stress.

In fact, an integrated approach based on multiple factors is thought to be of more consequence than symptomatic therapy that focuses on a single symptom (Rotem *et al*., 2005). A review of research (Iioka, 2009) noted that intervention studies about a variety of care programs for menopausal healthcare included drug therapy, decision-making support, therapeutic exercise, and health education. The effect of health behaviors and improvement of social psychological symptoms was a result of synergistic effects of interventions within a complex program. Generally, in Japan, outpatient treatment for menopause focuses only on drug therapy; care programs have not been implemented. Though health education is carried out at facilities such as public health centers, there have been no outcome studies and the number of studies regarding care programs combining health education and drug therapy in Japan is negligible. Therefore this study focused on perimenopausal women's ability to cope with stress by looking at the outcomes of a care program designed to improve stress-coping competency. The care program was developed based on a published work review (Iioka, 2009) of intervention studies targeting menopausal women that concluded that composite care programs and group discussions based on adult learning theory and cognitive–behavioral therapy were effective (Iioka, 2011).

Purpose and framework

This research aimed to evaluate the effectiveness of a stress management program, "A Stress Management Program to Aid Living with Menopause" (SM program), to enhance perimenopausal women's competency in coping with stress. This study viewed stress and coping through the various changes and confusion that face perimenopausal women.

Coping is a dynamic process that is constantly changing depending on the woman's individual cognitive appraisal style, amount and type of burden she is carrying, support system, and competency to cope (Lazarus & Folkman, 1984). Therefore, it is important to take an integrated perspective that includes the above process. Rather than applying specific coping strategies, the ability to cope with stress can be elevated through flexibly used coping strategies coupled with knowledge, and applied according to prevailing circumstances and an individual's condition. This study focused on stress management, not on relieving and reducing stress. Figure 1 shows this study's research framework based on definitions emerging from a systematic published

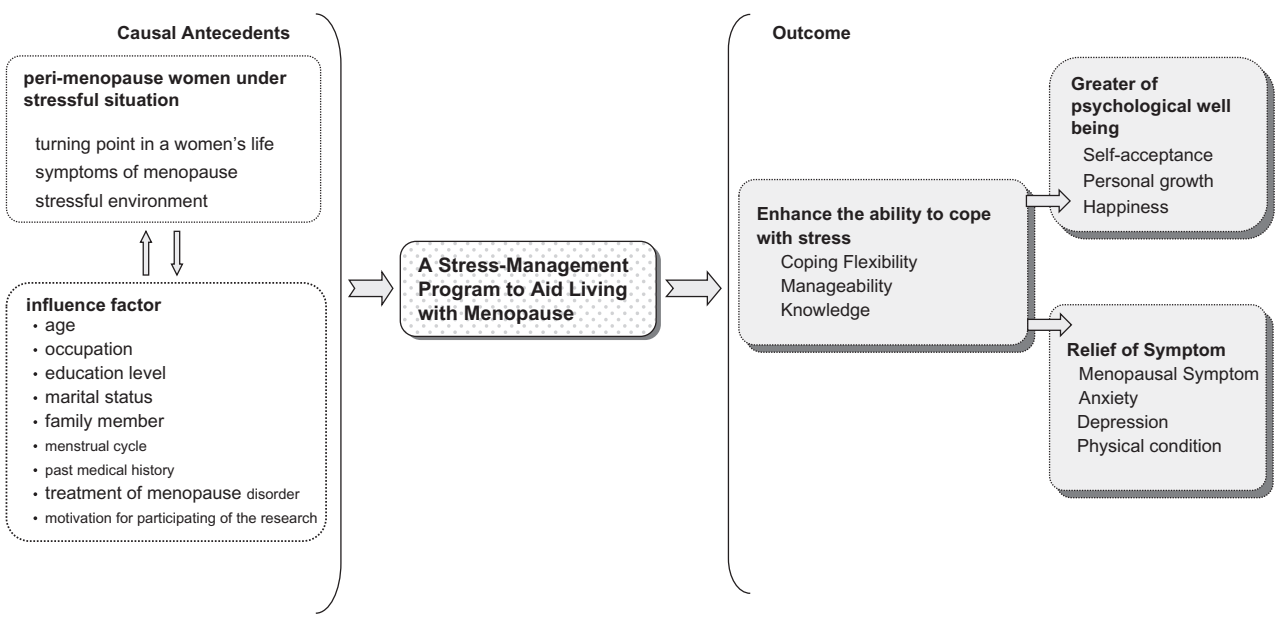

Figure 1 Conceptual framework.

Table 1 Hypotheses and measurements

	Hypothesis	Hypothesized outcomes	Instrument
Primary hypothesis	Compared with the control group, the SM program experimental group will show improved ability to cope with stress	Greater knowledge of menopause and stress management	Knowledge Test (KT)
		Increased coping flexibility	Coping Flexibility Scale (CFS)
		Heightened perception of manageability	Manageability (SCS-m)
Secondary hypothesis	Compared with the control group, the experimental group will have greater psychological well-being	Increased perception of personal growth	Personal Growth Scale (PGS)
		Increased perception of self-acceptance	Self-Acceptance Scale (SAS)
		Increased feeling of happiness	Happiness Scale (HS)
	Compared with the control group, the experimental group will experience a relief of symptoms	Improvement in perception of physical condition	Perception of Physical Condition Scale (PPC)
		Reduction in symptoms of anxiety	Hospital Anxiety and Depression Scale (HADS-A)
		Reduction in symptoms of depression	Hospital Anxiety and Depression Scale (HADS-D)
		Decreased severity of menopause related symptoms	Menopausal Symptom Assessment Chart (MSAC)

work review: "Ability to cope with stress was defined as an aptitude to assess ones coping abilities in relationship to circumstances and flexibly practice suitable coping techniques in accordance with circumstances" (Iioka, 2008, p. 31–35). In addition, the following hypotheses were formulated.

Primary hypothesis

The experimental group (EG) that participates in the SM program will demonstrate an enhanced ability over the control group (CG) to cope with stress. That enhanced ability to cope with stress will be indicated through improved coping flexibility and improved knowledge, which form the basis for coping skills.

Secondary hypotheses

1 The EG will have greater psychological well-being than the CG. Greater psychological well-being will be indicated by enhanced personal growth and self-acceptance, which target improving the decline in self-esteem, and a resulting enhanced feeling of happiness.
2 Compared with the CG, the EG will experience a relief of symptoms. The relief of symptoms will be indicated by an improvement in menopause symptoms, an improvement in anxiety and depression: factors crucial to considering the need for treatment, and an improvement in the perception of physical condition, which is an overall sense of well-being felt as a result of the previous two.

Table 1 indicates the specific outcomes and measurement tools.

METHODS

Research design

This study used a quasi-experimental design with non-random subject allocation. With the understanding that many women experiencing menopausal symptoms are psychologically fragile, randomization was not carried out to ensure the intervention would not place an undue burden on them. The EG of three to eight participants was offered an innovative composite program (SM program) of a 2 h session held once a week for 3 consecutive weeks.

The CG received one part of a self-guided learning program (SL program) each week. See Table 2 for program components

Subjects

Applications for the program were simultaneously solicited through public relations activities, utilizing posters and leaflets that summarized the two information options. To improve motivation and commitment, applicants chose the program in which they wished to participate.

Table 2 Contents of SM program and SL program

Intervention group	Program	Intervention period	Pedagogy	Topics
Experimental group (EG)	A Stress Management Program to Aid Living with Menopause (SM program)	Two hour sessions held once a week for 3 consecutive weeks. Three topics were provided every session.	Lecture	Information about menopause (mechanism of menopause, symptoms of menopause, treatment for menopause disorder)
				Information about stress management
				Dealing with stress
				Social skills training
				Cognitive restructuring
			Group discussion	Assimilation of information
				Meaning of my experience of menopause
				My stressor and response to stress
				How to deal with my stress
				My perception tendencies
				My communication style
				How to overcome menopause
			Hands on training	Stretching
				Acupressure points (by self, in pairs)
Control group (CG)	A self-guided learning program (SL program)	One part given to control group each week for 3 weeks.	Three part booklet	Content comparable to most menopause educational pamphlets
				Information about menopause (mechanism of menopause, symptoms of menopause, treatment for menopause disorder)

Inclusion criteria were: (i) one or more symptoms of menopause related to the stress response; (ii) between the ages of 44 and 56 years (the average age of menopause ± 2 standard deviations), or between the ages of 40 and 59 years; and (iii) had early menopause, late menopause, or surgical menopause. Excluded criteria were: (i) a score of 16 or higher on the Hospital Anxiety and Depression Scale (HADS); (ii) changes in treatment for menopausal symptoms in the past 3 months; (iii) a history of cancer or other chronic illness; and (iv) a diagnosis of mental illness.

Of the 60 women who applied for the EG, 55 were accepted, and of the 48 for the CG, 42 were accepted. Due to poor health, one woman in the EG dropped out, and one woman in the CG withdrew because of panic symptoms (Fig. 2).

DATA COLLECTION

Measurements

Primary outcomes (ability to cope with stress)

1 Knowledge Test (KT) (Appendix) is a true/false questionnaire developed by the researcher that tested knowledge about menopause (seven items) and stress management (eight items). A perfect score totaled 15 points. Cronbach's alpha coefficient was 0.69 for the entire scale, while it was 0.51 for the menopausal subscale and 0.59 for the stress management subscale in this study.

2 Coping Flexibility Scale (CFS) (Appendix) is a 6 point Likert scale (0 = "never"; 5 = "always") developed by the researcher on the basis of concept analysis results.

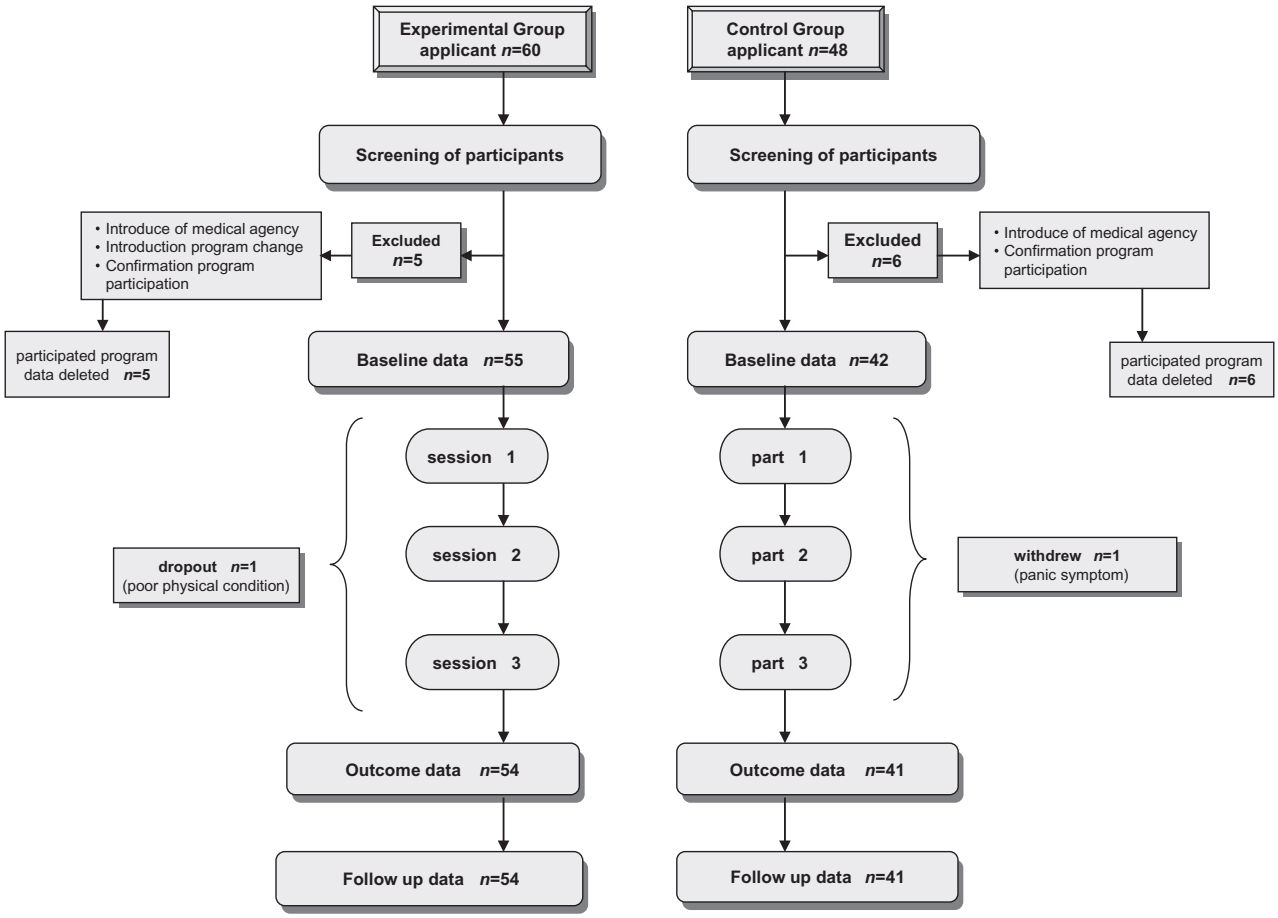

Figure 2 Flow of the participants through the research.

A factor analysis revealed two factors "ability to judge" (seven items) and "ability to flexibly respond" (five items). The cumulative contribution ratio was 50%. Cronbach's alpha coefficient was 0.79 for the entire scale, while it was 0.70 for the "ability to judge" subscale and 0.81 for the "ability to flexibly respond" subscale in this study.

3 Manageability Scale (SCS-m), a subscale of Antonovsky's (1987) Sense of Coherence Scale, was translated and further developed by Yamazaki (1997). It consists of 10 items scored from 1 ("never") to –7 ("always"). Manageability is defined as: "the sense of freedom to use the resources needed to overcome various problems when faced with future hardships or problems in major life settings" (Antonovsky, 1979; Yamazaki *et al*., 2001). Cronbach's alpha coefficient was 0.59 for the manageability subscale in this study.

Secondary outcomes (psychological well-being)

The Personal Growth Scale (PGS) (seven items) and Self-Acceptance Scale (SAS) (eight items) are subscales of the Psychological Well-Being Scale developed by Ryff, Keyes, and Lee (1995). Scoring is a on a 7 point Likert scale ranging from 15 to 90 points. The higher score indicates more self-acceptance and growth of personality. Cronbach's alpha coefficient ranged 0.76–0.90 with reliability and validity verified (Nishida, 2000). The Happiness Scale (HS) (Appendix) is a visual analog scale (VAS) that measures feelings of happiness with extremes of 100 "extremely happy" to 0 "extremely unhappy". The HS was developed by the researcher.

Secondary outcomes (relief of symptoms)

1 Perception of Physical Condition Scale (PPC) (Appendix) is a VAS ranging between 100 ("extremely good

physical condition") and 0 ("extremely bad physical condition"). The PPC was developed by the researcher.

2 Depression (HADS-D) and anxiety (HADS-A), both of which are subscales of the HADS developed by Zigmond and Snaith (1983), each with seven items on a 4 point Likert scale. Zigmond and Snaith (1983) verified the HAD reliability and validity. The usual cut-off point is 8 (Kitamura, 1993). Created a Japanese version. Cronbach's alpha coefficient was 0.87 for the entire scale, while it was 0.79 for the anxiety subscale and 0.80 for the depression subscale in this study.

3 Menopausal Symptom Assessment Chart (MSAC) developed by the Japan Society of Obstetrics and Gynecology (Honjo & Ohama, 2001) consists of 21 symptoms scored from 1 to 4 that are individually analyzed (ranging 0 = "never" to 3 = "strong").

Program assessment

The components of each program session were assessed for ease of understanding, satisfaction, usefulness, and self-efficacy. Following every session, each component was scored on a VAS 10 point scale from 0 ("extremely negative") to 100 ("extremely positive").

Participant characteristics

Data were collected on participant characteristics (age, occupation, marital status, and medical history), information about menopause (menstrual state, treatment for menopausal disorders), stressful events, and reasons for participation.

Data collection procedure

Outcome data were collected at three points: baseline data (T1, before intervention); outcome data (T2, immediately after intervention); and follow-up data (T3, 1 month later). The distribution and collection of data was conducted through the mail from April to November 2007. The program was carried out at St Luke's College in Tokyo.

Data analysis

P-values of less than 0.05 were accepted as significant. Statistical processing used SPSS version 17.0 (SPSS, Chicago, IL, USA). Intent-to-treat analysis and last observation carried forward were used in the statistical processing. The scales used for outcomes were totaled, and changes during the data collection period were calculated as a range (T1 → T2, T2 → T3, and T1 → T3) to determine differences for each individual.

Descriptive statistics were calculated and Student's *t*-test and χ^2-test were used to identify significant differences in participant characteristics between groups.Student's paired *t*-test was used to make comparisons within groups.

Ethical considerations

This research complied with the Declaration of Helsinki, and Ethical Guidelines for Nursing Research of the International Council of Nursing and personal information protection law in Japan (including explanation of study, confidentiality, right to refuse or withdraw without harm, anonymity when research published). During the research period, back-up measures involving gynecologists were put into place. Data collection commenced after the Research Ethics Committee of St Luke's College of Nursing approved this study (approval no. 06–085).

RESULTS

Subject characteristics

The average age of the participants was 49.7 years. The average age for the EG was 50.1, and 49.1 for the CG. There were no significant differences between participant characteristics (Table 3). Most worked on a full-time basis, and the number of women with higher education was relatively high. While 80% were not receiving treatment for menopausal symptoms, nine were being treated with hormone replacement therapy and five with herbal medicines.

Outcomes of hypotheses

Table 4 shows the scores for the various outcomes. Table 5 shows the statistical results (Student's *t*-test) obtained by comparing groups using differences in data between measured points. Table 6 shows the statistical results (paired Student's *t*-test) obtained from changes within the EG.

Primary hypothesis: Ability to cope with stress

The hypothesis, "compared to the CG, the EG's ability to cope with stress will improve" was generally validated. No significant statistical differences between groups were observed in any of the four measurements for ability to cope with stress. ANCOVA found no confounding factors of participant characteristics.

1 For the KT, scores for the EG increased in T2, and were sustained in T3. Comparing ranges between groups, there was a significant statistical difference from T1 to

Table 3 Characteristics of participants ($n = 97$)

		Experimental group ($n = 55$)		Control group ($n = 42$)			
		N	%	N	%	χ^2	*P*
Occupation	Full-time worker	18	32.73	21	50.00		
	Part-time worker	13	23.64	10	23.81		
	Self-employed	5	9.09	5	11.90		
	Homemaker or without paid occupation	14	25.45	4	9.52		
	Other	5	9.09	2	4.76	5.83	0.213
Education level	Junior college graduate/college/ graduate college	30	55.56	19	45.24		
	Vocational school	10	18.52	13	30.95		
	High school	14	25.93	9	21.43		
	Junior high school	0	0.00	1	2.38	3.50	0.320
Marital status	Married	45	81.82	33	78.57		
	Single	6	10.91	5	11.90		
	Divorce	4	7.27	4	9.52	0.2	0.906
Living status	With husband	14	25.45	8	19.05		
	With husband and children	21	38.18	13	30.95		
	With parent/s	8	14.55	3	7.14		
	Alone	5	9.09	6	14.29		
	Other	7	12.73	12	28.57	5.56	0.235
Menstrual cycle	Regular	12	23.08	19	46.34		
	Irregular	15	28.85	9	21.95		
	Menopause	25	48.08	13	31.71	5.65	0.059
Treatment of menopause disorder	No treatment	42	76.36	37	88.10		
	Past treatment	2	3.64	1	2.38		
	Under treatment:	11	20.00	4	9.52	2.21	0.331
	hormonal replacement therapy	7	12.7	2	4.8		
	herbal medicine	3	5.5	2	4.8		
	other	1	1.8	0	0		
Motive of participants (total members)	Relief of Symptom	4	7.27	5	11.90		
	Want to know about menopause	19	34.55	10	23.81		
	Want to live a healthy life	31	56.36	11	26.19		
	Invitation from a friend	5	9.09	11	26.19		
	Looks interesting	1	1.82	2	4.76		
	Other	2	3.64	3	7.14		

T2 and T1 to T3 ($t = 4.09$, $P = 0.000$; $t = 4.50$, $P = 0.000$). The KT was divided into items relating to menopause and stress management, and then analyzed. Compared to stress management-related items, menopause-related items showed a greater increase in score and a significant statistical difference in comparison of ranges from T1 to T2 and T1 to T3 ($t = 4.42$, $P = 0.000$; $t = 4.03$, $P = 0.000$; respectively), indicating that learning increased significantly.

2 For the CFS, only the EG indicated an increased sense of improvement in their ability to cope. No significant statistical differences between groups were found for any of the changes. However, a within-group comparison showed a significant increase in changes in the EG from T2 to T3 ($t = 2.12$, $P = 0.039$). There were no significant changes in "ability to judge" according to an analysis of subscales, but a within-group comparison unveiled a significant statistical increase from T1 to T3 in the EG's "ability to flexibly respond" ($t = 2.74$, $P = 0.008$).

3 For the SCS-m, the average score for SCS-m increased somewhat in the EG. An examination of the ranges did not denote any significant statistical differences in changes between groups. However, there was a

Table 4 Comparison of outcome scores between experimental and control group

	Scale		Time	Experimental group N	Mean	SD	Control group N	Mean	SD	*t*	d.f.	*P*	Confidence interval Lower	Upper
Primary outcome	Knowledge Test (KT)		T1	55	11.35	1.62	42	11.27	1.55	0.25	93	0.800	−0.57	0.74
			T2	**55**	**12.87**	**1.38**	**42**	**11.24**	**1.82**	**4.89**	**90**	**0.000****	**0.97**	**2.29**
			T3	**55**	**12.96**	**1.30**	**42**	**11.32**	**1.90**	**4.76**	**67**	**0.000****	**0.96**	**2.34**
	Coping Flexibility Scale (CFS)		T1	55	36.40	7.03	42	33.97	6.45	1.75	95	0.083	−0.33	5.19
			T2	55	36.20	6.98	42	33.51	6.22	1.97	95	0.052	−0.02	5.40
			T3	**55**	**37.36**	**5.89**	**42**	**33.83**	**6.29**	**2.84**	**95**	**0.006****	**1.06**	**6.00**
	Manageability (SCS-m)		T1	55	44.49	5.84	42	44.19	6.54	0.24	95	0.814	−2.21	2.80
			T2	55	45.64	6.11	42	43.95	5.35	1.42	95	0.158	−0.67	4.05
			T3	55	45.14	5.57	42	44.24	5.83	0.78	95	0.438	−1.41	3.22
Secondary outcome (psychological well-being)	Personal Growth Scale (PGS)		T1	55	38.64	5.79	42	37.64	5.13	0.88	95	0.381	−1.25	3.24
			T2	**55**	**39.42**	**5.60**	**42**	**36.83**	**5.57**	**2.26**	**95**	**0.026***	**0.31**	**4.86**
			T3	55	39.09	5.79	42	36.93	5.09	1.92	95	0.058	−0.07	4.40
	Happiness Scale (HS)		T1	55	67.18	19.10	42	70.43	19.65	−0.82	95	0.415	−11.11	4.62
			T2	**55**	**75.78**	**15.88**	**42**	**67.21**	**19.64**	**2.31**	**77**	**0.024***	**1.18**	**15.96**
			T3	55	70.84	19.27	42	67.93	20.22	0.72	95	0.473	−5.10	10.92
	Self-Acceptance Scale (SAS)		T1	55	26.66	6.31	42	26.60	5.86	0.05	95	0.957	−2.42	2.56
			T2	55	28.33	5.60	42	26.88	4.89	1.34	95	0.185	−0.71	3.61
			T3	55	28.22	5.38	42	26.93	5.25	1.18	95	0.240	−0.88	3.46
Secondary outcome (relief of symptom)	Perception of Physical Condition (PPS)		T1	55	53.13	22.51	42	57.64	24.05	−0.95	95	0.344	−13.95	4.92
			T2	55	60.93	20.31	42	57.38	22.21	0.82	95	0.415	−5.06	12.15
			T3	55	60.05	20.24	42	57.60	21.23	0.58	95	0.563	−5.95	10.87
	Depression (HADS-D)		T1	55	5.15	3.80	42	5.31	3.51	−0.22	95	0.828	−1.66	1.33
			T2	55	4.18	2.93	42	5.48	3.64	−1.94	95	0.055	−2.62	0.03
			T3	55	4.55	3.46	42	5.31	3.15	−1.12	95	0.266	−2.12	0.59
	Anxiety (HADS-A)		T1	55	5.22	3.46	42	5.86	2.64	−1.00	95	0.32	−1.91	0.64
			T2	55	5.05	3.09	42	5.74	3.31	−1.05	95	0.30	−1.98	0.61
			T3	55	5.35	3.62	42	5.60	3.40	−0.35	95	0.73	−1.69	1.19
	Menopause Symptom Assessment Chart (MSAC)	Hot flush/flash	T1	54	2.05	1.079	42	1.64	0.932	1.973	94	0.051	−0.003	0.826
			T2	54	2.11	1.076	42	1.93	1.021	0.851	94	0.397	−0.246	0.614
			T3	42	2.143	1.072	41	2.073	0.848	0.328	81	0.744	−0.353	0.493
		Sweats easily	T1	54	2.59	1.252	42	2.19	1.110	1.640	94	0.104	−0.085	0.889
			T2	54	2.55	1.142	42	2.36	1.055	0.834	94	0.407	−0.262	0.641
			T3	42	2.381	1.147	41	2.585	1.183	−0.799	81	0.426	−0.713	0.304
													*$P < .05$	**$P < .01$

d.f., degrees of freedom; SD, standard deviation.

Table 5 Outcome score differences between experimental and control group (Student's *t*-test)

Scale			Difference between data	Experimental group			Control group						Confidence interval	
				N	Mean	SD	N	Mean	SD	*t*	d.f.	*P*	Lower	Upper
Primary outcome	Knowledge Test (KT)		**T1 → T2**	**55**	**1.50**	**1.75**	**42**	**0.06**	**1.47**	**4.09**	**88**	**0.000****	**0.74**	**2.15**
			T2 → T3	55	0.06	1.37	42	0.14	1.21	−0.29	89	0.775	−0.63	0.47
			T1 → T3	**55**	**1.55**	**1.56**	**42**	**0.08**	**1.56**	**4.50**	**91**	**0.000****	**0.82**	**2.12**
Secondary outcome (psychological well-being)	Personal Growth Scale (PGS)		**T1 → T2**	**55**	**0.78**	**3.52**	**42**	**−0.81**	**3.39**	**2.24**	**95**	**0.027***	**0.18**	**3.00**
			T2 → T3	55	−0.33	2.84	42	0.10	3.60	−0.65	95	0.518	−1.72	0.87
			T1 → T3	55	0.45	3.92	42	−0.71	4.01	1.44	95	0.153	−0.44	2.78
	Happiness Scale (HS)		**T1 → T2**	**55**	**8.60**	**13.54**	**42**	**−3.21**	**22.36**	**3.22**	**95**	**0.002****	**4.54**	**19.09**
			T2 → T3	55	−4.95	13.57	42	0.71	18.98	−1.71	95	0.090	−12.22	0.90
			T1 → T3	55	3.65	17.28	42	−2.50	17.01	1.75	95	0.083	−0.83	13.14
Secondary outcome (relief of symptom)	Perception of Physical Condition (PPS)		**T1 → T2**	**55**	**7.80**	**15.43**	**42**	**−0.26**	**22.10**	**2.11**	**95**	**0.037***	**0.49**	**15.63**
			T2 → T3	55	−0.87	20.43	42	0.21	22.91	−0.25	95	0.806	−9.85	7.67
			T1 → T3	55	6.93	25.15	42	−0.05	21.34	1.44	95	0.152	−2.62	16.57
	Menopause Symptom Assessment Chart (MSAC)	Hot flush/flash	T1 → T2	55	0.04	0.58	42	0.28	0.74	−1.79	75	0.077	−0.52	0.03
			T2 → T3	55	−0.07	0.50	42	0.14	0.75	−1.62	68	0.110	−0.48	0.05
			T1 → T3	**55**	**−0.04**	**0.72**	**42**	**0.43**	**0.83**	**−2.89**	**81**	**0.005****	**−0.78**	**−0.15**
		Sweats easily	T1 → T2	55	−0.05	0.93	42	0.17	0.82	−1.16	95	0.247	−0.57	0.15
			T2 → T3	**55**	**−0.21**	**0.69**	**42**	**0.21**	**0.78**	**−2.83**	**95**	**0.006****	**−0.72**	**−0.13**
			T1 → T3	**55**	**−0.25**	**1.06**	**42**	**0.38**	**0.94**	**−3.08**	**95**	**0.003****	**−1.05**	**−0.23**
													*$P < .05$	**$P < .01$

d.f., degrees of freedom; SD, standard deviation.

Table 6 Outcome score differences within groups for the experimental group (Student's paired *t*-test)

	Scale	Difference between data	Mean	SD	Confidence interval Upper	Confidence interval Lower	*t*	d.f.	*P*
Primary outcome	Coping Flexibility Scale (CFS)	T1 → T2	0.20	4.37	−0.98	1.38	0.34	54	0.736
		T2 → T3	**−1.16**	**4.08**	**−2.27**	**−0.06**	**−2.12**	**54**	**0.039***
		T1 → T3	−0.96	4.32	−2.13	0.20	−1.66	54	0.104
	Manageability (SCS-m)	**T1 → T2**	**−1.15**	**3.90**	**−2.21**	**−0.10**	**−2.19**	**54**	**0.033***
		T2 → T3	0.50	3.49	−0.45	1.44	1.06	54	0.294
		T1 → T3	−0.66	4.24	−1.80	0.49	−1.15	54	0.256
Secondary outcome (psychological well-being)	Self-acceptance Scale (SAS)	**T1 → T2**	**−1.67**	**3.95**	**−2.74**	**−0.60**	**−3.13**	**54**	**0.003****
		T2 → T3	0.11	3.21	−0.75	0.98	0.26	54	0.793
		T1 → T3	**−1.55**	**4.05**	**−2.65**	**−0.46**	**−2.85**	**54**	**0.006****
Secondary outcome (relief of symptom)	Depression (HADS-D)	**T1 → T2**	**0.97**	**2.96**	**0.17**	**1.77**	**2.43**	**54**	**0.019***
		T2 → T3	−0.37	2.63	−1.08	0.34	−1.04	54	0.304
		T1 → T3	0.60	3.74	−0.41	1.61	1.19	54	0.240
	Anxiety (HADS-A)	T1 → T2	0.16	2.75	−0.58	0.91	0.44	54	0.660
		T2 → T3	−0.29	2.76	−1.04	0.46	−0.78	54	0.438
		T1 → T3	−0.13	3.46	−1.06	0.81	−0.27	54	0.786
									*$P < .05$ **$P < .01$

d.f., degrees of freedom; SD, standard deviation.

significant increase seen within the EG from T1 to T2 ($t = 2.19$, $P = 0.033$).

Correlation coefficients were calculated to examine the relationship among the four indicators for ability to cope with stress. A significant correlation was indicated in the CFS and SCS-m ($r = 0.42$, 0.61, $P < 0.01$, respectively).

Secondary hypothesis: Psychological well-being

The hypothesis, "compared to the CG, the EG's psychological well-being will improve" was generally validated. No significant statistical difference was observed between groups in T1 for any of the three measurements for psychological well-being. In addition, the ANCOVA for the range that detected a significant difference between groups did not show any extraneous factors that became confounders in any of the three indicators.

1 For the PGS, the average score did not increase in the EG, but did drop somewhat in the CG. CG respondents indicated that they were unable to realize their growth whereas the EG respondents were able to maintain that perception. A significant statistical difference was observed by comparing the score range between groups from T1 to T2 ($t = 2.24$, $P = 0.027$), but no significant difference was seen in changes to T3. In other words, the sense of personal growth only increased immediately after the intervention.
2 For the HS, the average score increased in the EG, but decreased in the CG. This indicates that the intervention increased the sense of happiness. A significant statistical difference was observed by comparing the score range between groups from T1 to T2 ($t = 3.22$, $P = 0.002$). However, the average score for the EG in T3 was close to the T1 score, and no significant difference was seen in the comparison of range between groups from T1 to T3.
3 For the SAS, there was almost no change in average scores in either groups or significant statistical difference in range. A significant statistical increase was observed within the EG from T1 to T2 and from T1 to T3 ($t = 3.13$, $P = 0.003$; $t = 2.85$, $P = 0.006$, respectively) indicating a significant improvement in self-acceptance.

Correlation coefficients were calculated to examine the relationship among the three indicators for psychological well-being. A significant correlation was seen among all three indicators ($r = 0.37$, 0.55, $P < 0.01$, respectively).

Secondary hypothesis: Relief of symptoms

The hypothesis, "compared to the CG, the EG will experience relief of symptoms" was generally unsubstantiated. No significant statistical differences were observed between groups in T1 for any of the four measurements for relief of symptoms. In addition, the ANCOVA for the range that detected a significant difference between groups did not show any extraneous factors that could have been confounders in any of the five indicators.

1 For the PPC, following the intervention, the average EG score increased and a significant statistical difference in the range was detected between groups from T1 to T2 ($t = 2.11$, $P = 0.037$). The average EG score remained high even in T3, but no significant difference was seen.
2 For the HADS-D, the average score did not change in the CG, but decreased for the EG after the intervention, indicating a decrease of depressive symptoms. However, no significant statistical difference in range was detected between groups. A within-group comparison revealed a significant drop in the EG from T1 to T2 ($t = 2.43$, $P = 0.019$), but because the average EG score for T3 returned somewhat to the original score, no significant difference was observed.
3 For the HADS-A, the average score showed no large changes in either group, and no significant difference in either group when comparing the range between groups. A HADS-A score of 8 or higher was classified as suspicious. Therefore, two subgroups (EG, $n = 13$; CG, $n = 13$) scoring 8 or higher were analyzed. The Mann–Whitney *U*-test was conducted to compare groups. In a comparison of range from T1 to T2, the anxiety score for the EG declined significantly more ($U = 41.50$, $P = 0.026$) than the CG.
4 For the MSAC, the "hot flash" symptom grew more pronounced in T2 and T3 in the CG, and an analysis of range from T1 to T3 revealed a significant difference between groups ($t = 2.89$, $P = 0.005$). Also, the symptom "sweats easily" grew stronger for many women in the CG from T2 to T3. There was a significant statistical difference in range seen between groups from T2 to T3, and from T1 to T3 ($t = 2.83$, $P = 0.006$; $t = 3.08$, $P = 0.003$; respectively).

For the EG, the "sweats easily" symptom greatly decreased. No other symptoms showed a significant difference.

No difference was noted in the scores or ranges for the seven stress responses related to menopausal symptoms: (i) difficulty sleeping; (ii) waking up in the middle of the night; (iii) easily irritated; (iv) always anxious; (v) worrying over small things; (vi) easily brood over things; and (vii) become depressed, lethargic, and easily tired. Correlation coefficients were calculated among measurements for symptom relief. Total scores for seven MSAC symptoms were used. There was a negative correlation among HADS-A, HADS-D, and MSAC for PPC ($r = -0.27$~-0.40, $P < 0.05$). MSAC, HADS-A, and HADS-D had a somewhat strong correlation ($r = 0.62$, 0.55, $P < 0.01$, respectively).

Program assessment

The SM program was given extremely high marks. It was assessed at an average of 88 points on ease of understanding, satisfaction, usefulness, enjoyment, and self-efficacy: lectures (83.3–90.0 points), group discussions (81.5–90.8 points), and hands-on learning (83.6–93.4 points). No differences were seen in assessments for method of presentation. The three methods of presentation had synergistic results and are interpreted as functioning in an integrative manner. In the EG, most women also made changes in their health management actions. There were 12 who changed their eating habits and nine who started to exercise, a greater number than in the CG.

DISCUSSION

Program effectiveness

Primary hypothesis: Ability to cope with stress

The increase in knowledge resulting from this study is identical to existing intervention studies (Liao & Hunter, 1998; Hunter & O'Dea, 1999). The group education was particularly effective. This outcome is identical to Winzenberg *et al.* (2005) who examined differences in educational methods. Incorporating one's own experiences into a discussion of the information provided a deeper understanding that can be translated into one's own knowledge, suggesting that education gained through group discussion increases effectiveness. In addition, based on the andragogy assumptions put forth by Knowles (Merrian & Caffarella, 2005), the SM program conducted discussions regarding the knowledge provided that compared and checked against the women's own experiences while looking back on their own living conditions. It is believed that even greater educational effectiveness was displayed through discussions based on andragogy. Care programs are effective when educational views are utilized to encourage learning effectiveness, rather than simply providing information. There was a propensity toward an increase in CFS from T2 to T3. After an intervention begins, it is expected that time is needed before changes manifest in the attribute of flexibility to cope. A long period is likely necessary before women are able to flexibly apply coping skills in accordance with circumstances. Evaluation of the ability to control of the situation is similar to Bandura's self-efficacy (Lazarus & Folkman, 1984). As efficacy expectancies increase and the person judges his or her resources more adequately for satisfying task demands, the relationship is appraised as holding the

potential for more control and therefore as less threatening (Lazarus & Folkman, 1984). The most effective way to create a strong sense of efficacy is through the control experience; successful experience creates a stronger belief in personal efficacy (Bandura, 1995). It takes numerous successful experiences to become more self-aware. Thus, a long-term follow up is required. The SCS-m measures manageability understood as coping with life events. Menopausal stress in this study was treated as a mix of life events and daily problems. Examples and discussion themes that used daily problems were constructed in the SM program, suggesting the possibility of improving the ability to cope with daily problems, although the program's approach to life events was insufficient. Furthermore, it was thought that positive changes in ability to cope with daily problems could be expected at the 1 month follow up. If women could successfully cope with daily problems, then at some point they would also be able to handle life events, but quite a long follow-up period is required to confirm this change. Also, the coping ability addressed in the SM program referred to "a response pattern temporarily produced in a specific situation", but manageability includes "a uniform responsive style that exists at any time" (Antonovsky, 1979). The SM program and outcome indicators did not address this.

It is believed that the foundation for stress coping was strengthened because knowledge about menopause and coping with stress increased, and the schema for menopause led to modifications. However, those outcomes were not clearly demonstrated in indicators that questioned actual coping skills. Therefore, although it is difficult to state that the skills to cope with stress improved, the outcomes indicated the possibility of improving competency.

Secondary hypothesis: Psychological well-being

The SM program allowed participants to learn from like individuals, provided participants with numerous opportunities to speak up, and made it easier for them to feel that they were growing. Therefore, the SM program is surmised to have had a positive effect on personal growth. The SM program allowed participants to objectively reexamine themselves and encouraged self-acceptance. It included content where participants asked themselves questions such as "what are my stressors?" There are many changes in roles during menopause: women face erratic symptoms, their sense of control deteriorates, and they more easily experience identity diffusion. A reexamination of self through the program is believed to be effective for these menopausal women.

The SM program based on the cognitive–behavioral therapy method resulted in the demonstration of cognitive modifiability, but did not extend to behavior modification. However, behavior modification can be anticipated as an outcome of cognitive modifiability. While only a small fraction of the outcome of cognitive–behavioral therapy on menopause symptoms has been studied, the possibility of outcomes has been indicated (Alder *et al*., 2006). The outcomes of this study also point to the expectation of further possibilities related to cognitive–behavioral therapy.

Group discussion is surmised to have had a large impact on these results, which are identical to Vinogradov & Yalom (2003) group psychotherapy outcomes. The SM program is also thought to have encouraged a realization of the universality of their experience, a cathartic effect, and the discovery that there is value in the present even when directly confronting a difficult reality. Reaction to change differs for each individual, but in some instances it can be accompanied by negative feelings, such as denial, confusion, regret, and anxiety (Shindo, 2001). When trying to identify with and deepen understanding of menopause, it was difficult to eliminate the aforementioned emotions through self-study. The SM program offered the chance to share negative feelings with other women undergoing a similar experience and thus diminishing the intensity.

Almost no studies exist related to menopause that measure happiness in the outcome indicators. Only one study (Ueda, 2004) measured level of satisfaction with life, but it did not show significant effects. The fact that this study showed effectiveness in HS is highly significant. The SM program relieved feelings of loneliness through discussions with others undergoing the same experience. This increased the number of opportunities for the women to feel a sense of liberation and led to heightened feelings of happiness. Also, menopausal women tend to lose sight of their role and have a reduced sense of self-esteem (Yamada, 1999). Part of the SM program asks participants to "praise themselves". They then received positive feedback from others in the areas in which they felt inadequate, giving them a conscious experience of success. The program is thought to have led to what Kan (2005) called "the happiness of doing" and "the happiness of being". The happiness of being is deeply rooted in the Eastern culture, and its relationship to health has been indicated (Kan, 2005). This study measured broad-based feelings of happiness, but the effects on feelings of happiness should be examined in more detail in the future.

Secondary hypothesis: Relief of symptoms

Although there were no specific symptom improvements, there was an enhanced sense of well-being, which is a comprehensive barometer.

In existing research on menopausal treatments, improvements in depression and anxiety symptoms were validated in a long-term, 6–10 week, composite program (Alder *et al*., 2006). The outcomes of this research, which showed a trend toward effectiveness in a short period, should be regarded as important. These outcomes were gained because the SM program incorporated a cognitive approach, strengthened the recognition of self, reduced feelings of isolation, boosted self-worth, and improved symptoms of depression. Participants also acquired a sense of ease from knowing they were not alone, and were able to look toward the future through discussions about similar experiences. This enabled them to handle uncertain circumstances and relieve anxiety. Although screening for serious depression and anxiety symptoms is necessary, the SM program could be offered to patients who are exhibiting mild symptoms.

An effect was seen on vasomotor symptoms of menopause. Even though participants thought that vasomotor symptoms were outside of their control, a greater awareness of symptoms resulted in fewer hot flashes and sweats in the EG.

Menopausal symptoms depend on a variety of factors and can wildly vary within a single day. It is thought that this uncertainty impacted the assessment of symptom alleviation. This kind of symptom control is extremely difficult, although several long-term studies implementing 10–12 week programs using drug therapy observed improvements in menopausal symptoms (Granz *et al*., 2000; Rotem *et al*., 2005; Ueda, 2004). However, the fact that this study indicated symptom awareness can be potentially effective, shows a new direction for care.

Program effectiveness

The SM program aimed to improve coping ability from the stress perspective without focusing on relief of symptoms and continuation of health actions. This viewpoint has not been addressed in previous research on menopause care, and was a novel approach under the broad concept of stress in accordance with the complicated phenomenon of menopause. In addition, because a focus on improving coping skills through an educational approach without the goal of stress reduction had not been previously undertaken in stress research, it was implemented as a new endeavor. Though the outcomes of this research are not as strong as those from a long-term program that aims for behavior modification, or a treatment program utilizing tools such as drugs or acupuncture, the fact that the existence of a significant possibility for cognitive change was indicated is an important discovery, given that establishing outcomes is difficult through a short-term intervention targeting menopausal women with a tendency toward emotional imbalance. An improvement in psychological well-being was also demonstrated and the possibility for other outcomes indicated, allowing the suggestion that it is an effective form of care. Therefore, this research is significant in that a new directionality was shown in the researches of menopausal care and stress. Furthermore, it appears that focusing on the ability to cope with stress, such as stress management, is appropriate not only for menopause, but also for phenomena where individual differences are great and specific health behaviors are difficult to present. It can be considered as a demonstration of new possibilities.

The program was easily accepted with a low dropout rate and high subjective assessment. Moreover, the fact that it encouraged constant reconciliation to adapt to individual circumstances while offering numerous resources means it was an effective form of care for the menopausal women. The program was highly rated in terms of satisfaction, usefulness, enjoyment, and self-efficacy in regard of the lectures, discussions, and hands-on training. The hands-on training encouraged interaction among fellow participants, likely impacted discussions, and is expected to have synergistic outcomes. Although direct outcomes cannot be established for each intervention method in composite programs such as this, from a practical perspective, the satisfaction of participants should be one of the factors that are focused on. There is a need to give further consideration to the evaluation methods of composite programs, such as whether it is appropriate to measure every intervention or total outcomes, and how to measure synergistic outcomes.

The outcomes suggest the conceptual framework can be validated. However, the causal association between the primary outcome and secondary outcomes was not reviewed and is an issue for further examination.

Implications for health care

It is possible to offer perimenopausal women, who are experiencing a physically and mentally unstable period, a program where members proactively participate, rather than a program where the provider offers leadership. In fact, this style empowers the participants and is expected to improve psychological well-being. No

intervention studies previously existed that focused on stress in menopausal treatment, and the validation of effectiveness through this kind of approach points the way to a new kind of care. Medical care for menopause must build health care from an integrated perspective rather than simply alleviating symptoms. A framework based on dealing with stress is beneficial. This study has clarified specific care and the direction that the role of nursing should take, and the results may contribute to the development of nursing in the medical treatment of perimenopause.

Research limitations and future issues

This study used a non-equivalent control design, weakening external validity and calling into question the interactions of self-selection and changes resulting from time on outcomes. A randomized controlled trial, larger sample size and psychometric development of some indicators are needed to clearly verify program effectiveness. In addition, the program content and presentation method must be further refined.

CONCLUSION

The SM program addresses stress management and can be provided in a variety of settings. It also can be expected to have a synergetic effect when combined with treatment for menopausal disorders, and is anticipated to be effective for women who prefer not to medicate or women who have comparatively minor symptoms. Furthermore, it encourages team care, efficiency in treatment, and contributes to reducing medical fees. To offer this type of health care, however, it would be necessary to ensure medical treatment fees and human resources. Towards that end, issues that verify program effectiveness and effective nursing should be immediately addressed.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

AUTHOR CONTRIBUTION

Y. I. was responsible for research concept and design, acquisition of subjects and data, analysis and interpretation of data, and preparation of manuscript; H. K. suggested the entire research.

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APPENDIX

Knowledge Test: KT

Place a ○ in the ( ) when a statement below is correct and an × when inappropriate. Answer without looking at information on hand such as data, books, internet, etc.

Q1 ( ) Since women gain weight when they enter menopause, they should be careful of their diet. (M)
Q2 ( ) It is better to eliminate stress. (S)
Q3 ( ) Menopausal symptoms include symptoms caused when the hypothalamus in the brain, called the command center, panics. (M)
Q4 ( ) It is better to take some kind of action even in circumstances where it appears you cannot be in control. (S)
Q5 ( ) Various symptoms appear when the balance of energy, blood, and water circulating within the body is upset.
Q6 ( ) Menopausal stress is not a significant problem since it is not a major stress like disaster or bereavement. (S)

Q7 ( ) The reason menopausal symptoms are different for each woman is related to whether the onset of menstruation is early or late. (M)
Q8 ( ) Swimming, which is whole-body motion, is more effective than walking in the prevention of osteoporosis. (M)
Q9 ( ) Physical reaction to stress is the body's way of trying to protect itself. (S)
Q10 ( ) Menopausal symptoms usually go away in 3 years. (M)
Q11 ( ) Praising yourself becomes a source of personal energy. (S)
Q12 ( ) It is not good to express your feelings because it encourages becoming emotional. (S)
Q13 ( ) Acupuncture points are pressed when inhaling. (S)
Q14 ( ) The only symptoms of menopause are hot flashes and sweating. (M)
Q15 ( ) Hormone replacement therapy has rejuvenating effects. (M)
M, menopause item; S, stress management.

Coping Flexibility Scale: CFS

Choose an answer on the right concerning ways to cope with stress. Circle the appropriate number that indicates the extent to which each item applies to you.

		Never	Almost Never	Occasionally true	Sometimes true	Relatively true	Always	Subscale
1	When something difficult happens, I consider whether it is something I can cope with myself.	0	1	2	3	4	5	A
2	I can flexibly cope with things that happen around me.	0	1	2	3	4	5	B
3	Even though something seems like it can be immediately handled, it takes time before I realize that "it is impossible to cope with myself".	0	1	2	3	4	5	A
4	To solve problems I think I can cope with on my own, I consider them from different angles.	0	1	2	3	4	5	B
5	I think deeply about this or that, even when it comes to things that are impossible to handle myself.	0	1	2	3	4	5	A
6	There are times when I take on too much and regret it later.	0	1	2	3	4	5	A
7	I can adapt to my surroundings and make the best use of my skills.	0	1	2	3	4	5	B

Coping Flexibility Scale: CFS Continued

		Never	Almost Never	Occasionally true	Sometimes true	Relatively true	Always	Subscale
8	When something does not go well, I try a different approach.	0	1	2	3	4	5	B
9	When something bad happens, I think that it's all my fault.	0	1	2	3	4	5	A
11	At times I become physically exhausted even though I do not think I am overdoing things.	0	1	2	3	4	5	A
12	I can cope in my own way while skillfully relating to my surroundings.	0	1	2	3	4	5	B
13	I often think that my efforts go unrewarded.	0	1	2	3	4	5	A

A, ability to judge; B, ability to flexibly respond.

Perception of Physical Condition Scale (PPC), Happiness Scale (HS)

The following inquires about your current perception of physical condition and feeling of happiness. Without thinking too deeply, indicate how you feel by marking an × to show the extent of your feelings.

Please mark an × to show how you feel now about your physical condition.

Extremely good physical condition — extremely bad physical condition

Please mark an × to show your feeling of happiness right now.

Extremely happy — . . . extremely unhappy