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The Effects of Perceived Stress and Attitudes toward Menopause and Aging on Symptoms of Menopause

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Abstract

As part of a longitudinal study of midlife women, the aim of this investigation was to describe the intensity of menopausal symptoms in relation to level of perceived stress in a woman's life and her attitudes toward menopause and aging. Data were collected on 347 women between the ages of 40–50 in Northern California who began the study while pre-menopausal. Women self identified as African American, European American, or Mexican/Central American. Data collected over 3 time points in the first 12 months were used for this analysis. An investigator-developed tool for perception of specific types of stress was used. Attitudes toward menopause and aging were measured using the Attitudes Toward Menopause and Attitude Toward Aging Checklists. Attitudes toward aging and menopause, perceived stress, and income were related to intensity of symptoms. There was no ethnic group difference in perceived stress or attitude toward menopause. However, European and African Americans had a more positive attitude toward aging than Mexican/Central Americans. A lower income, higher perceived stress, a more negative attitude toward aging, and a more positive attitude toward menopause influenced menopausal symptom experience.

Keywords

perceived stress; attitude; aging; menopause; symptoms

INTRODUCTION

Currently in the United States there are more than 44 million women between 45–54 years of age. More than half of women in this age group report physiological or psychological symptoms often attributed to menopause, with 30% who indicate that symptoms are bothersome. [2, 3] Frequently reported symptoms include difficulty sleeping, night sweats, headaches, hot flushes or flashes, vaginal dryness, forgetfulness, dizzy spells, stiff joints, feeling tense or nervous, feeling blue or depressed, and irritability.[2] The inability to cope

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with these symptoms, particularly hot flashes, is the most frequent reason women of this age group visit their healthcare provider.4

Menopause has been defined as the permanent cessation of menstruation due to loss of ovarian follicular activity clinically presenting as 12 months of amenorrhea. Perimenopause is a common, yet more vague term, historically used to herald the transition from when menstrual and endocrine changes begin to occur until 12 months after the final menstrual period.5 'Premenopause' is another term that has traditionally denoted an arbitrary time normally associated with the decade before typical menstrual changes are noted. 5 Studies have shown that women may experience hormonal changes earlier than previously thought.5 Experts currently recommend using staging criteria for pre-, peri-, and post-menopause based on empirical research findings. 5–7, Nomenclature has been proposed that includes cycle length changes that begin to occur before episodes of amenorrhea.5–7 (Figure 1.) Women who note a change in cycle length of more than seven days, but unaccompanied by amenorrhea or an increase in follicle stimulating hormone (FSH) are in 'early transition' to menopause. Those who report 90 days or more of amenorrhea accompanied by an increased FSH enter 'late transition' to menopause.5–7 Cycle length changes contribute to the current understanding of reproductive aging and may explain why women report symptoms earlier than would be expected based on amenorrhea or FSH levels alone. 5–7

The presence and severity of symptoms vary tremendously from woman to woman and can last from months to years during this transitional period. 2,4,–7 Some symptoms have been attributed to a decline in estrogen, which accompanies menopause, but researchers do not find consistent associations between hormone levels and symptom experience.2,3,5, 8, 9 The wide variation in symptom reporting motivated researchers to explore psychological or social correlates of the menopausal symptom experience. Some have postulated that it is the woman's attitude toward menopause or aging, or issues related to self esteem and body awareness that affect her ability to cope with the menopause transition.8, 10, 11 Others posit that education, ethnicity, and lifestyle habits, including smoking, exercise and obesity, play a role in the symptom experience. 2,12–15 Depression has also been reported to be associated with menopause transition. 3,11, 16,17

Lazarus suggests that appraisals of challenging everyday life situations, whether conscious or unconscious, are followed by a response, or emotion.18 The perception and meaning that we place on these thoughts and actions may influence our appraisal of whether or not we perceive the occurrence as a threat to our well-being. If a threat is perceived, a stress response may be triggered which could subsequently have an effect on symptom experience. Lazarus further proposed that emotions interconnect with social and physical conditions of importance, personal values, and belief systems.18 Menopause and aging may be viewed as a loss, or as a threat to youth. A woman's attitude toward this change in her life may subsequently influence her appraisal of the occurrence and may impact her level of distress associated with the experience. A woman's perception of symptoms alerts her to changes in her body, and may propel her to explore ways to alleviate or manage the associated distress. Dodd and colleagues have conceptualized symptom experience as an interface between perception and evaluation that can be positive and result in a healthy healing response, or can be problematic and require a tailored intervention from a health care provider. 20

This study aimed to explore the association of women's pre-existing attitudes toward menopause, aging, and perception of stress with subsequent intensity of vasomotor symptoms often associated with menopausal transition (hot flashes, night sweats, day sweats, and vaginal dryness). The longitudinal nature of this investigation permitted assessment of these pre-existing perceptions before periods of amenorrhea were noted and prior to any increase in FSH. We hypothesized that psychological factors (perceived stress

and attitudes toward aging and menopause) would predict intensity of vasomotor symptoms after controlling for biological and social factors (age, income, education, ethnicity, FSH level, body weight, and smoking).

METHODS

This analysis is drawn from a larger 5-year study of midlife women and bio-psycho-social health. Demographic data were collected at enrollment and updated on an annual basis; data on symptoms and menstrual cycles were collected every two months; and laboratory data and questionnaire data were obtained every six months. Attrition at 18 months was less than 10% and was associated with subject burden or geographical relocation. Details of the recruitment and retention strategies are reported elsewhere.[21]

Data from the larger study for this analysis included demographic characteristics from baseline (Time 1), data on attitudes toward menopause and aging, and stress perception at the 6 month interval (Time 2), and height and weight measures obtained at enrollment, 6 months, and 12 months (Time 3). Body mass index (BMI) was calculated at each visit by weight in kilograms divided by height in meters squared. Urinary FSH level was obtained at baseline, 6-months, and 12 months and used in conjunction with regularity of menstrual cycles to categorize menopausal status. First morning voided samples were obtained, frozen, and then processed and analyzed for FSH level by Endocrine Sciences, Inc. laboratory facilities (Esoterix Endocrinology, Calabasas Hills, CA). Cycle length change that would indicate 'early' transition to menopause (or premenopause in this study) and cycle irregularity that would indicate 'late' transition (or perimenopause) was collected during telephone calls at 2-month intervals when symptoms were also assessed.

All participants reported regular menstrual cycles and had low levels of FSH consistent with functioning ovaries and premenopausal status at the initial assessment. Symptoms were assessed for presence and intensity every two months by telephone during the first year of the study, and symptom intensity at the 12-month (Time 3) assessment was the outcome variable for this analysis. Predictor variables included biological (age, BMI, smoking, FSH levels, and menopause status); social (education, income, and ethnicity); and psychological (attitudes toward aging and menopause, and perceived stress).

Study Instruments

Attitude toward menopause was measured with the Attitudes Toward Menopause Checklist created by Neugarten et al.[22] The instrument consists of 35 items rated on a 4-point Likert scale from strongly agree (1) to strongly disagree (4). Internal consistency reliability was adequate (Cronbach alpha = .80) and concurrent validity between this tool and Bowles' Menopause Attitude Scale was sufficient (Pearson r = .63).[22]

The Attitude Toward Aging scale was used to measure attitude toward aging.[23] This scale has 22 items rated on a 4-point Likert scale from strongly agree(1) to strongly disagree(4). It combines items from other instruments that have demonstrated adequate content validity and high reliability coefficients reported elsewhere in similar community based samples.[23] A higher score indicates a more positive attitude for both scales.[23]

Stress perception was measured using four items developed by the research team to address specific sources of stress (work, family, personal, and health) and then an item about overall level of current stress in their lives. Participants were asked to rate their overall stress on a 5-point Likert scale from very stressful(1) to not at all stressful(5). Concurrent validity (Pearson r = −.64) was obtained when compared with scores on the 10-item Perceived Stress Scale that assesses general stress during the past month.[24]

A composite sum of intensity of the four most common menopausal symptoms (hot flashes, night sweats, day sweats, and vaginal dryness) was computed from an alphabetized list of 52 symptoms in the Women's Health Study Symptom Questionnaire.25 These data were collected by telephone interview every two months. The 12-month composite score was used as the dependent variable. Vaginal dryness, although less common than the three vasomotor symptoms, has been reported during menopause transition2 and was equal in prevalence to day sweats in this sample. To assess intensity, participants were asked, "did you experience [symptom] over the past week?" If experienced, they were then asked to rate it "minimal (1)" if the feeling was very minor, "mild (2)" if it only slightly interfered with their daily function, "moderate (3)" if it noticeably interfered with their daily function, and "extreme (4)" if it was the worst they had ever felt. The total intensity score of the four combined symptoms could range from 0 to 16.

Statistical Analyses

Pearson correlation analysis examined bivariate relationships between independent and dependent continuous variables and Chi-square was used to examine dichotomous outcomes. One-way ANOVA and multiple comparison analysis (Tukey's post hoc) were used to test differences in means between the three ethnic groups. Hierarchical linear regression models were used in the final analysis to estimate the amount of variance explained by the predictor variables after controlling for selected potential confounding biological and social factors.

RESULTS

Sample Characteristics

The total number of participants at the initial assessment was 347 and their demographic data are reported in more detail elsewhere.21 Since the aim of this analysis was to examine how stress and attitudes influenced reporting of symptoms attributed to menopause, and symptoms could alter one's attitudes and perceived stress, 16 women who had high FSH levels and reported changes in menstrual regularity indicative of 'late transition' at Time 2 were excluded from the current analyses. The study sample thus consisted of 266 women who remained in the study for the first 12 months and completed the Time 3 assessment. There were no significant differences in attitudes toward menopause or aging between those who remained in this analysis at 12 months (Time 3) and those who did not remain in the analysis.

Descriptive data for all variables are reported in Table 1. One-way analysis of variance (ANOVA) and post hoc analyses demonstrated significant differences ($P < .05$) between ethnic groups in: 1) income level, with European Americans having higher income than the other two groups; 2) education level, with Latinas less educated than the other two groups); and 3) BMI, with European Americans lower than the other two groups. There were no group differences in FSH level, reproductive stage of menopause, or smoking history.

Attitude Toward Menopause and Attitude Toward Aging

The mean score for Attitude Toward Menopause was 73.5 (SD 8.5) with a range of 46 to 110. The mean score for Attitude Toward Aging was 58.9 (SD = 6.9) with a range of 38 to 74. These two instruments were significantly correlated ($r = .396$) but the correlation was not strong enough to conclude that these were measuring the same concept. In other words, the more positive the attitude toward menopause, the more positive the attitude toward aging, but attitude about one was not the same or predictive of the other. A one-way ANOVA revealed no differences in mean Attitude Toward Menopause scores between the three ethnic groups. However, there was a significant ethnic group difference in Attitude

Toward Aging scores, with European and African Americans scoring significantly higher (P < .01), reflecting a more positive attitude toward aging than Mexican/Central Americans (Table 1).

Stress Perception

At each time point, close to 75% of participants reported their specific family, personal, work and health stress levels to be either "fairly stressful" or "very stressful." The overall current level of perceived stress at Time 2 ranged from 1(high) to 5 (low), with a median of 3.0 (fairly stressful) and mean of 2.8 (SD = .95). One-way ANOVA demonstrated no ethnic group difference in overall level of perceived stress (Table 1).

Menopausal Status and Symptoms

At 12 months, 266 women continued to have low FSH levels and regular menstrual cycles. Yet 35.7% (n = 95) reported at least one of the four most common symptoms of menopause: 8% (n = 21) reported day sweats; 8% (n = 22) reported hot flashes; 12% (n = 31) reported night sweats; and 8% (n = 21) reported vaginal dryness. Of those who reported any of the four symptoms, 23% (n = 22) were African American, 37% (n = 35) were European American, and 40% (n = 38) were Mexican/Central American. These ethnic differences did not reach statistical significance (p = .16).

Although there were no differences in menopausal status or age between the ethnic groups, nearly twice as many Mexican/Central American women (6%; n = 16) reported having both hot flashes and night sweats when compared to European American (3%; n = 8) and African American (4%; n = 9) women (p < .01).

Intensity of Symptoms at 12 months (Time 3)

Of the 266 participants available for analysis at 12 months, 77% (n = 205) reported no symptoms; 18% (n = 49) had mild symptoms (score 1 to 4); and 5% (n = 13) had moderate symptom intensity (score 5 to 12). No one had severe (score 13 to16) symptom intensity in this sample. European Americans reported significantly less intense symptom experience than Mexican/Central Americans (P < .05) only after Tukey's post hoc analysis was conducted. Correlates of Symptom Intensity

Women with lower income, a more negative attitude toward aging, and higher perceived stress (low score), reported more intense symptoms at Time 3 (Table 2). The women were all between 40 and 50 years of age, and there was a non-significant (P = .051) trend toward the older women reporting more intense symptoms than the younger women. A hierarchical linear regression analysis included all 11 biological, social, and psychological variables in the model to examine which set of predictors best account for the variance in symptom intensity at 12 months More intense symptoms at 12 months were reported by the older women who had less income, higher overall stress perception, a more negative attitude toward aging, and a more positive attitude toward menopause. The final model accounted for 14% of the variance in symptom intensity at 12 months.

DISCUSSION

Even though the overall prevalence of menopausal symptoms was low in this community-based sample of healthy women most likely in early menopause transition, some did report symptoms. Psychological factors (level of perceived stress and attitudes toward aging and menopause) were significant predictors of self-reported menopause symptom intensity at 12 months. These factors remained significant when key biological factors that included BMI, smoking, age, FSH level and menopause status and key social factors including income,

education and ethnicity were included in the model. We anticipated that negative attitudes would be associated with higher symptom intensity. This was the case in regards to attitude toward aging; however, women with a more positive attitude toward menopause later reported more intense symptoms. This contradicts Bloch's findings in a cross-sectional survey of 51 women between 43 and 63 years of age where those with a negative attitude toward menopause were more distressed by their symptoms.[8] In this study, attitudes were assessed 6 month prior to symptom experience, and it is possible that as symptoms may have increased, a change in attitude may have been seen.

Our finding related to attitude toward aging and impact on symptom experience supports previous studies.[8, 10] In this community-based sample of healthy midlife women, a negative attitude toward aging was associated with later symptom intensity. This may reflect the concerns women have about aging in general. Viewed through Lazarus' theory of stress and coping, [18] results would indicate that, as women appraise their symptom experience, they may interpret their symptoms as a sign of aging and their symptom experience would be intensified if they had a negative attitude toward aging.

Even though many women in this sample did not report intense symptoms in this early transition period, those who did have intense symptoms also reported high levels of stress at their previous assessment point six months earlier. This effect may be due to biological interactions within the endocrine system itself, or may be a result of symptoms being an added stressor in a woman's life. If a woman had recently experienced a high level of stress, the symptoms of menopause may be experienced as more intense. Their perception of stress was linked to menopausal symptoms in a recent investigation but was likely due to the cross-sectional nature of the study.[11] We found no differences in the overall perception of stress between the three ethnic groups, regardless of income and education, but most of our sample appraised their lives as stressful or very stressful and this was associated with their symptom experience.

The difference in prevalence of menopausal symptoms noted between ethnic groups supports findings from other studies.[13, 15, 26–28] Avis, et al.[27] evaluated the effect of menopausal changes on health-related quality of life and found that when compared to other ethnic groups studied, Hispanic women had lower quality of life subscales. Avis et al.[26] and Gold et al. [28] documented that hot flashes were more often reported by African Americans than other ethnic groups. Both African American and Hispanic women reported more vasomotor symptoms when compared to Japanese, Chinese, or European American women in Gold et al.'s study.[28] In our sample, a larger percentage of Mexican/Central American women reported vasomotor symptoms than did European Americans or African Americans. However, symptoms had a relatively low prevalence and the difference in symptom intensity between European American and Mexican/Central American women did not remain significant after adjusting for income and education. All three ethnic groups had similar attitudes toward menopause, but the significant difference in attitude toward aging between European American and Mexican/Central American women needs further investigation in relation to socio-cultural beliefs about aging.[29] These data support results from a large international study in Latin America that found an alarming decrease in quality of life among midlife women when compared to younger women.[30]

The results of the present study support prior associations between income and symptom experience.[2, 14, 28] Gold, et al. reported that after adjusting for other risk factors, the prevalence of symptoms was higher for those who had greater difficulty paying for basic needs.[28] Guthrie et al. found that women who reported bothersome hot flushes were less likely to be in full or part-time paid work.[14]

One limitation to this longitudinal study is that by the third assessment at 12 months, participants were between 41 and 51 years of age and many had not yet entered late transition stage and most had low symptom intensity. Thus, statistical power to detect significant differences was limited. However there were 69 women who reported either hot flashes or night sweats, and 31 women who reported both, while still being considered 'premenopausal' (or early transition) at Time 3 (as assessed by FSH level and menstrual cycle regularity).

CLINICAL IMPLICATIONS

Clinicians caring for midlife women should be aware that women report symptoms even before they are "officially" in late transition or 'perimenopause,' and while their FSH levels remain normal, and their cycles remain regular. As has been suggested, 5 7 the changes in cycle length that women experience before the onset of irregular cycles may be accompanied by various symptoms. A clinical checklist of menstrual changes (cycle length, menstrual flow and duration) and symptom intensity may enhance communication for women who do not readily report their symptom experience.

The results of this study also support the need for women's healthcare providers to be alert to midlife women who may be experiencing high levels of stress or reporting concerns about aging. These women may be at risk for distressing menopausal symptoms as they transition through the stages of menopause. The association between income and symptoms found in this study and other studies warrants the need to assess economic struggles that midlife women may be experiencing and to be alert to their impact on symptom experience. Additionally, clinicians who work with midlife populations of Latinas should consider the potential for decreased quality of life related to aging and transitioning through menopause. A bilingual checklist may improve communication of concerns between Latinas and their healthcare provider.

What causes some women to experience menopausal symptoms more intensely than others, and the extent to which some women report their experiences as more distressful than others, remains largely unexplained. The finding that many women determined to be 'premenopause' in this study nonetheless experienced symptoms suggests the need for further research on women in their early 40s, prior to changes in regularity of menstrual cycles. These findings also support that women may begin experiencing changes earlier than the onset of changes in periods of amenorrhea and FSH levels. Furthermore, additional inquiry is needed to better understand the association between lower income and symptom experience. The complexity of midlife women's lives pose challenges to researchers and healthcare providers alike. The many variables and factors that impact symptom experience may be more thoroughly addressed through a qualitative approach in order to better understand individual women's experiences during the decade that surrounds menopausal transition.

Biographies

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					Final Menstrual Period (FMP)		
Stages:	**-5**	**-4**	**-3**	**-2**	**-1**	▼**0**	**+1**	**+2**
Terminology:	Reproductive			Menopausal Transition		Postmenopause	
	Early	Peak	Late	Early	Late*	Early*	Late
				Perimenopause			
Duration of Stage:	variable			variable		ⓐ 1 yr	ⓑ 4 yrs	until demise
Menstrual Cycles:	variable to regular	regular		variable cycle length (>7 days different from normal)	≥2 skipped cycles and an interval of amenorrhea (≥60 days)	Amen x 12 mos	none	
Endocrine:	normal FSH		↑FSH	↑FSH		↑FSH	

*Stages most likely to be characterized by vasomotor symptoms   ↑ = elevated

Figure 1.

Table 1

Characteristics of 266 Midlife Women by Ethnic Group

Participants at T3 who were pre-menopausal at T2[a]	Total N = 266	African American n=61	European American n=135	Mexican/Central American n=70
Age at T3, mean (SD),y	44.3 (2.32)	44.1 (2.24)	44.4 (2.16)	44.5 (2.38)
Income at T3, median	$51,000	$41,000	$61,000[c]	$46,000
Level of Education at T3, n (%)				
12th grade or less	17 (6.4)	3 (5)	4 (3)	14 (20)
college or higher, n (%)	169 (64.5)	41 (67)	99 (73)	30 (43)[c]
Current smoker at T3, n (%)	26 (10)	9 (15)	12 (9)	5 (7)
Body mass index (BMI) at T3., mean (SD)	27.7 (6.4)	29.3 (6.7)	26.2 (6.0) [c]	29.2 (6.2)
Follicle-stimulating hormone (FSH), mean (SD), IU/dL	.88 (1.4)	1.06 (1.6)	.79 (1.4)	.89 (1.2)
(Not sure how to handle the ± here in the last three columns.)				
Attitude Toward Menopause scale score at T2, mean (SD)	73.5 (8.5)	75.4 (9.2)	72.9 (7.3)	72.9 (9.6)
Attitude Toward Aging scale score at T2, mean (SD)	58.9 (6.9)	59.3 (7.4)	60.0 (6.1)	56.1 (7.1) [c]
Overall current stress at T2, mean (SD)	2.8 (.95)	2.9 (1.0)	2.7(.93)	2.8 (.94)
Intensity of Symptoms[d] at T3, mean (SD)	.89 (2.2)	.89 (1.9)	.64 (1.8)	1.4 (3.0)
Hot flashes or night sweats, n (%)				
	71 (27)	18 (30)	35 (26)	18 (26)
Both hot flashes and night sweats, n (%)	33 (12)	9 (15)	8 (6)	16 (23)[b]

[a]T2=Time 2=six month interval; T3=Time 3=12 month interval

[b]P < .01 (One-way ANOVA)

[c]P < .001 (One-way ANOVA)

[d]composite variable that included intensity of four symptoms: hot flashes, night sweats, day sweats, and vaginal dryness

Table 2

Bio-Psycho-Social Variables Independently Associated with Menopausal Symptom Intensity (N = 266).

Variable	Pearson correlation coefficient
Biological	
Age	.11
Follicle-stimulating hormone (FSH)	.00
Menopause status	−.04
Smoking	.07
Body mass index (BMI)	.11
Social	
Education	−.05
Income	−.20[a]
Psychological	
Attitude Toward Menopause	.05
Attitude Toward Aging	−.18[b]
Perceived Stress	−.16[c]

The Pearson correlation coefficient refers to the strength of the correlation between the variables in Column 1 and Symptom Intensity. Small correlations are indicated by a coefficient range of .1 to .3, moderate correlations from .4 to .6 and strong correlations .7 and above. Generally, a negative coefficient indicates an inverse relationship. The level of perceived stress variable was coded such that a low score (1) = more stress than a high score (5) Predictor variables were measured at T2 (at 6 months); Outcome and potential confounding variables were measured at T3 (at 12 months) in attempt to assess a temporal relation

[a]$P < .05$

[b]$P < .01$

[c]$P < .001$