



Symptoms during the perimenopause: prevalence, severity, trajectory, and significance in women's lives

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This article examines published evidence from longitudinal studies of the menopausal transition that address the following questions: (1) Which symptoms do women report during the perimenopause, and how prevalent are these symptoms as women traverse the menopausal transition? (2) How severe are symptoms and for how long do they persist? (3) To what do women attribute their symptoms, and do their attributions match findings from epidemiologic studies of community-based populations? (4) How significant are these symptoms in women's lives? Data from published longitudinal studies were examined for evidence bearing on each of these questions. Only vasomotor symptoms, vaginal dryness, and sleep disturbance symptoms varied in prevalence significantly across menopausal transition stages and postmenopause in >1 population studied. A minority of women report severe symptoms. Given the limited follow-up data available, it is unclear how long symptoms persist after menopause. Women attribute their symptoms to a variety of biologic and psychosocial factors, and their attributions correspond well to those correlates identified in epidemiologic studies of community-based populations. The significance of symptoms for women's lives remains uncertain. The impact of symptoms during the perimenopause on well-being, role performance, adaptation to demands of daily living, and quality of life warrants additional study. The appraisal of the consequences of perimenopausal symptoms by women from different ethnic groups will be enhanced significantly as a result of the Study of Women's Health Across the Nation (SWAN) and other studies in progress.

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As women complete the transition to menopause, an estimated 85% report ≥ 1 symptom, such as hot flashes, depressed mood, or sleep disruption, that prompts nearly

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10% of women to visit a healthcare provider.¹ In the post-Women's Health Initiative Study (WHI) era, symptom management has become more complex owing to awareness of the risks associated with hormone therapy (HT).² Women use a range of symptom management options, including such self-care strategies as use of over-the-counter preparations; complementary and alternative therapies, such as herbal preparations; exercise programs and other lifestyle modifications; and taking prescription drugs.^{1,3} Contact with health professionals during the perimenopause creates an opportunity for women to consider strategies for both symptom management and promotion of healthy aging. The paucity of data about women's experiences of symptoms and their efforts at symptom management during the perimenopause, however, limits health professionals' awareness of typical experiences of community-based populations of women as contrasted with the subset of women seeking

healthcare. Moreover, clinicians do not have access to data about the meanings women assign to their experiences.

The purpose of this article is to examine published evidence of the prevalence of menopause-related symptoms reported by participants in longitudinal studies of the menopausal transition to address the following questions: (1) Which symptoms do women report during the perimenopause, and how prevalent are these symptoms as women traverse the menopausal transition? (2) How severe are symptoms and for how long do they persist? (3) To what do women attribute their symptoms, and do their attributions match findings from epidemiologic studies of community-based populations? (4) How significant are these symptoms in women's lives?

Methods

Data from published community-based longitudinal studies of the menopausal transition were reviewed for evidence bearing on each of the questions presented above.^{1–12} Where possible, the Staging Reproductive Aging Workshop (STRAW) criteria were used to approximate the stage of menopausal transition and to promote comparison of data specific to menopausal transition stages across multiple studies.¹³ The STRAW stages are based on menstrual cycle patterns and include the following: (1) late reproductive stage, denoted by minor changes in cycle length, particularly decreasing length of the cycle; (2) early menopausal transition stage, indicated by increasing irregularity of menses without skipping periods (>7 days' difference from the beginning of a given cycle to the next, experienced after previously regular cycles); (3) late menopausal transition stage, characterized by skipping periods (amenorrhea >60 days); and (4) postmenopause, spanning the time from a woman's final menstrual period (FMP) to the end of her life. Classification of the menopausal transition stages for most studies was based on retrospective histories of menses, although some recent studies have incorporated daily diary recordings.^{7,12}

Findings from studies of community-based populations

Prevalence of symptom reporting

Women at midlife report hot flashes and sweats, depressed mood, sleep disturbances, sexual concerns or problems, cognitive symptoms, vaginal dryness, urinary incontinence, and somatic or bodily pain symptoms. Because women experience these symptoms at many other points in their lives (as do men, with the exception of the vaginal symptoms), none can be said to be specific to the perimenopause.

Hot flashes

The prevalence of hot flashes among women who had not begun the menopausal transition (STRAW late reproductive stage) ranges from 6%⁴ to 13%.¹⁴ As women progress from the early to late menopausal transition stages (from noting changes in their cycle regularity to skipping menstrual periods), the prevalence of hot flashes increased (late reproductive, 4% to 46%; late menopausal transition, 33% to 63%).^{1,14} For women who had completed menopause (STRAW postmenopause, defined as ≥ 1 year with no menses), the prevalence rose as high as 79%¹⁴ (Table 1^{4–6,10,14–20}).

The peak prevalence of hot flashes occurs during the late menopausal transition stage (labeled "late perimenopause" in several of the studies) and during the early postmenopause. Because many studies have not included follow-up beyond the first 1 or 2 years of postmenopause, it is difficult to discern when or whether hot flashes cease.

Depressed mood

Where reproductive stage measures are available, the prevalence of depressed mood symptoms (e.g., feeling sad or blue) ranged from 19% to 29%. For women in the early or late menopausal transition stages, prevalence estimates ranged from 28% to 29%; for those who had completed menopause, the prevalence of depressed mood symptoms ranged from 24.5% to 29% (late reproductive) to 23% to 28% (late MT) to 23% to 34% (postmenopause)^{4,21–27} (Table 2^{4,5,19,22–24,28–32}).

Several investigators have used the Center for Epidemiologic Studies Depression Scale (CES-D) to obtain estimates of depressed mood. Using a cut point of 16 to identify women with scores resembling those of patients with major depressive disorders, investigators estimated that the prevalence of depressed mood for women in the reproductive stage ranged from 11.6% to 15%.^{28,32} Estimates ranged from 1% to 19% for women in the early menopausal transition stage, from 13% to 18% for those who were in the late menopausal transition stage, and from 1% to 17% for those who were postmenopausal.^{5,23,26,28,32} As a basis of comparison, 22.4% of women in the Harvard Study of Moods and Cycles had CES-D scores >16, with 8.6% having scores >24.¹¹ In the Seattle Midlife Women's Health Study, overall prevalence estimates of women with CES-D scores >16 ranged from 26% to 28%. Estimates from SWAN were that 24% of the total sample had scores >16.^{22,27}

Few studies have incorporated clinical diagnosis of depression using the *Diagnostic and Statistical Manual of Mental Disorders—4th Edition* (DSM-IV) criteria. The recent exceptions are the Penn Ovarian Aging Study,³² in which women were interviewed to identify cases of major depressive disorder (MDD), and the Harvard Study of Moods and Cycles,¹¹ in which women between the ages of 36 and 45 years were interviewed for evidence of DSM-IV criteria for past or current major depression. In the Penn

Table 1 Prevalence of vasomotor symptoms from selected longitudinal studies

Study	Study Population	Measures	STRAW MT Stage			
			Late Reproductive	Early MT	Late MT	Postmenopause
Healthy Women Study ⁴	460 women, aged 42–50 yr (19 black, 183 white), randomly selected from drivers' licenses and census lists	Checklist of 27 symptoms administered in follow-up clinical examination	6%	NA	NA	43%
Manitoba Project on Women and Their Health in the Middle Years ^{5,16}	469 women, aged 45–55 yr, selected from nonrandom mail survey, 145 with hysterectomy	Checklist of symptoms ¹⁹	Hot flashes, 13.8%	NA	39.7%	41.5%
			Night sweats, 10.6%	NA	27.6%	22.2%
Norwegian Menopause Project ⁶	200 women, aged 45–55 yr (of 1,886 women studied in 1981), followed annually for 5 yr	Symptoms reported in interview, as well as frequency and whether troubled by symptoms	Hot flashes, Very troubled, 12%	NA	46%	67% (1 yr) 61% (2 yr) 18% (1 yr) 12% (2 yr)
Melbourne Women's Midlife Health Project ¹⁴	453 women, aged 45–55 yr, from a population-based Australian sample	Symptoms over past 2 wk, frequency/day, and bother ²⁰	Hot flashes (>1/day), 13%	NA	37%	
	172 women who had made a transition to perimenopause or postmenopause (in 2000)	As above	Bothered, 6% Hot flashes, 10% Sweats, 10%	NA 15%	26% 42%	42% (1 yr) 41% (2 yr) 35% (1 yr) 24% (2 yr) 48.8%
SWAN ^{15,17}	16,065 women, aged 40–55 yr, from multiracial/ethnic sample, 7 sites, community-based sampling strategies to include African American, Chinese American, Japanese American, Hispanic, and European American women	Self-reported questionnaires, asked whether they had hot flashes/sweats over the past 2 wk	19.4%	36.9%	56.8%	
Penn Ovarian Aging Study ^{10,18}	Women, aged 35–47 yr, randomly selected from community (African Americans = 219; European Americans = 217)	Standardized menopause symptoms checklist regarding hot flashes over the past month/severity	Hot flashes (6 yr), 37%	48%	63%	79%

MT = menopausal transition; NA = estimate not available from published literature; STRAW = Staging Reproductive Aging Workshop; SWAN = Study of Women's Health Across the Nation.

Table 2 Prevalence of depressed mood symptoms from selected longitudinal studies

Study	Study Population	Measures	STRAW MT Stage			
			Late Reproductive	Early MT	Late MT	Postmenopause
Massachusetts Women's Health Study ²²⁻²⁴	2,352 white women, aged 45-55 yr, randomly selected from from Massachusetts state census lists	Asked if sad or blue/depressed over past 2 wk (symptom checklist)	29.1%	NA	28.1%	33.8%
Healthy Women Study ⁴	460 women, aged 42-50 yr (19 black and 183 white), randomly selected from drivers' licenses and census lists	Beck Depression Inventory	4.5%	NA	NA	5.9%
National Health Examination Follow-up Study ²⁸	394 women, aged 40-58 yr, selected using stratified probability sample of adult, noninstitutionalized civilian population	CES-D measures repeated 10 yr apart; cut point, >16	13%	NA	19%	17%
Manitoba Project on Women and Their Health in the Middle Years ^{5,19,29}	469 women, aged 45-55 yr, selected from nonrandom mail survey, 145 with hysterectomy	Questionnaire asking whether depressed or blue	24.5%	NA	23.2%	23.0%
SWAN ^{30,31}	3,015 of 3,302 women selected from 7 sites	Persistent mood symptoms included dysphoric mood, feeling blue or depressed, irritable or grouchy, tense or nervous, and frequent mood changes >6 days/wk	8%-12%	14.9%-18.4%	NA	NA
	16,065 women, aged 40-55 yr	Psychologic distress (feeling tense, depressed, and irritable in the previous week)	20.9%	NA	28.9%	22%
Penn Ovarian Aging Study ³²	Women, aged 35-47 yr, randomly selected from community (African Americans = 219, European Americans = 217)	Interviews using CES-D conducted at baseline and 4 yr later	CES-D >16 12%-15%	1.4%-7.8%	13.1%-18.3%	1%-13.8%
		Interviews to identify MDD	MDD 10%-13%	1%-4%	<1%	<1%

CES-D = Center for Epidemiologic Studies Depression Scale; MDD = major depressive disorder; MT = menopausal transition; NA = estimate not available from published literature; STRAW = Staging Reproductive Aging Workshop; SWAN = Study of Women's Health Across the Nation.

Table 3 Prevalence of sleep disturbance symptoms from selected longitudinal studies

Study	Study Population	Measures	STRAW MT Stage			
			Late Reproductive	Early MT	Late MT	Postmenopause
Melbourne Women's Midlife Health Project ¹⁴	438 women observed for 7 yr; 172 women advanced from premenopause to perimenopause or to postmenopause	33-item symptom checklist administered annually; subjects indicated whether they had trouble sleeping	31%	32%	38%	38% (1 yr) 43% (2 yr)
SWAN ³⁵	12,603 women, aged 40–55 yr	Self-reported questionnaire: subjects asked whether they had experienced difficulty sleeping in past 2 wk	31.4%	39.6%	45.5%	43.2%

MT = menopausal transition; STRAW = Staging Reproductive Aging Workshop; SWAN = Study of Women's Health Across the Nation.

Ovarian Aging Study, the prevalence of MDD was 10% to 13% of women classified as being in reproductive stages and 1% to 4% of those in the early menopausal transition.³² Follow-up with this population can yield important findings on the progression/persistence of MDD. To date there is a single published report from a small-sample (n = 29) longitudinal study of initial onset of depression during the menopausal transition.³³ These findings are being replicated in the SWAN cohort.³⁴

Persistence of depressed mood from reproductive stages to postmenopause has received minimal attention. Bromberger and colleagues²⁷ defined persistence of depressed mood as having dysphoric mood (feeling blue or depressed, irritable or grouchy, tense or nervous) and frequent mood changes for >6 days per week. In the SWAN population, cross-sectional estimates of persistent depressed mood ranged from 8% to 12% among women in the late reproductive stage and 14.9% to 18.4% for women in the early menopausal transition stage.³⁵ Woods and Mitchell²⁶ reported data on the persistence of high CES-D scores (>16) among women who were in the early menopausal stage or in a reproductive stage. Over a 1-year period they found that 60% of these women scored <16, but 13% scored >16 during both years.

The Seattle Midlife Women's Health Study investigators identified clusters of women based on their CES-D scores (level and trajectory) over a 10-year period.²⁵ The most prevalent cluster included women who had nondepressed scores (4 to 7) and low-level scores (8 to 10). Other clusters included women with moderate-level scores (10 to 19) that remained constant, improved, or worsened over time and a cluster of women with high scores (most >24) that remained constant over time. There was no evidence of a relation between progression through the menopausal transition stages and CES-D scores in this cohort.²⁵

Sleep symptoms

Estimates of sleep disturbances range from 31% for women in the reproductive stage to 45% for women who are 3 years postmenopausal.¹⁴ SWAN found that 4,632 of >16,000 women reported difficulty sleeping.¹⁵ The odds of reporting difficulty sleeping were greater for women who were in the early or late menopausal transition stages or who were postmenopausal compared with those in the reproductive stage. Unfortunately, data from ongoing longitudinal studies are not yet available (e.g., SWAN, Seattle Midlife Women's Health Study, Penn Ovarian Aging Study) about the prevalence of sleep difficulty as women progress through the menopausal transition stages (Table 3).^{14,35}

Sexual symptoms

Data from the Massachusetts Women's Health Study³⁶ revealed that menopausal status (being classified as in the menopausal transition or postmenopause) was related to experiencing lowered sexual desire, believing that interest in sexual activity declines with age, and that being postmenopausal was associated with decreased arousal when compared with women's own experiences in their 40s. Postmenopausal women reported a lower degree of desire and less arousal than women who were in reproductive stages or in a menopausal transition stage. Low estradiol levels were associated with dyspareunia.³⁶ Melbourne Women's Midlife Health Project (MWMHP) scores on the Shortened Personal Experiences Questionnaire (SPEQ) indicated that the prevalence of any type of sexual dysfunction rose from 42% to 88% as women became postmenopausal.^{37,38} There was a significant decrease in total SPEQ score, sexual interest, responsivity, and frequency of sex as well as a significant increase in dyspareunia and reports of partners' problems in sexual

Table 4 Prevalence of sexual, cognitive, vaginal, urinary, and pain symptoms from selected longitudinal studies

Study	Study Population	Measures	STRAW MT Stage			
			Late Reproductive	Early MT	Late MT	Postmenopause
Melbourne Women's Midlife Health Project ^{37,38}	172 women who had made a transition to perimenopause or postmenopause reported on symptoms	SPEQ scores indicating sexual dysfunction	NA	42%	88%	NA
		Vaginal dryness over past 2 wk, frequency and bothersomeness; prevalence of bothersome symptom	3%	4%	21%	25% (1 yr) 32% (2 yr)
		Urine control problems over the past 2 wk	17%	12%	14%	14%
		Aches or stiff joints over the past 2 wk	41%	47%	53%	53% (1 yr) 57% (2 yr)
SWAN ¹⁵	16,065 women, aged 40–55 yr, participating in baseline survey	Vaginal dryness over past 2 wk	7.1%	12.9%	18.2%	21.2%
		Urine leakage over past 2 wk	12.3%	20.6%	19.6%	17.7%
		Stiffness/soreness over past 2 wk	45.8%	57.9%	58.4%	54.8%
		Forgetfulness over the past 2 wk measured on symptom checklist	31.2%	44%	44.8%	42.0%

MT = menopausal transition; NA = not available from published literature; SPEQ = Shortened Personal Experiences Questionnaire; STRAW = Staging and Reproductive Aging Workshop; SWAN = Study of Women's Health Across the Nation.

performance as women moved through the menopausal transition.^{15,37} Prior sexual functioning and decreasing estradiol levels, but not androgen levels, were associated with sexual dysfunction as measured on the SPEQ (**Table 4**).^{15,37,38} When participants in the Penn Ovarian Aging Study described libido (i.e., interest in sex) in the past month, 27% reported decreased libido. Fluctuating testosterone levels—but not the testosterone, dehydroepiandrosterone sulfate (DHEAS), estradiol, or follicle-stimulating hormone (FSH) levels measured over the study period—were associated with reports of decreased libido.³⁹ These findings suggest that fluctuation may be more important than the level of estrogens and androgens during the menopausal transition.

Cognitive symptoms

Although cognitive symptoms are prevalent (e.g., problems remembering names), few women rate their symptoms as serious.⁴⁰ When women were asked about their attributions, they linked their memory problems to increased role burden and stress, getting older, physical health problems, menstrual cycle changes, hormone changes, inadequate concentration and emotional changes, but few mentioned menopause.⁴¹ Only SWAN has examined changes in cognition in various stages of the menopausal transition: experiences of forgetfulness were reported by 31% of participants in the

reproductive stage, 44% in the early menopausal transition stage, 44.8% in the late menopausal transition stage, and 42% in postmenopause.¹⁵

A cross-sectional analysis of data from the MMWHP indicated that memory did not vary with any variables that measured estrogen exposures, including menopausal transition stage, time from the FMP, use of HT, or serum estradiol concentration.⁴² The single longitudinal analysis of cognitive assessments to measure working memory and perceptual speed indicated that the measures improved for women in the late reproductive and early menopausal transition stages over a 2-year period. Significant decreases in Symbol Digit Modalities Test scores were evidenced only for postmenopausal women, a pattern consistent with expected changes related to aging.⁴³

Vaginal symptoms

Vaginal dryness was common as women proceeded through the menopausal transition. In the MWMHP, symptoms of vaginal dryness were reported as bothersome by 3% of women in the reproductive stage, 4% of women in the early menopausal transition, 21% of women in the late menopausal transition, and 47% of women who are 3 years postmenopausal.¹⁴ In the SWAN cohort, 1,629 of >16,000 women providing baseline data reported vaginal dryness. Menopausal status (progression through the transition), was

associated with vaginal dryness as was age.¹⁵ This symptom is also related to the reports of sexual dysfunction and is included in some measures (e.g., in the SPEQ) as an indicator of sexual dysfunction.

Urinary symptoms

In the MWMHP, the prevalence of urinary symptoms was reported as 17% in women in the late reproductive stage, 12% in women in the early menopausal transition, 14% in women in the late menopausal transition, and 14% in women who were postmenopausal.¹⁴ Participants in SWAN (n = 2,135 of >16,000) reported leaking urine over the past 2 weeks. Menopausal transition stage and age were correlated.¹⁵ In a more complete assessment of symptoms of incontinence, frequency, and severity completed at the beginning of the longitudinal phase of SWAN, 57% of women reported incontinence, with 15% rating it as moderate and 10% as severe. Being in a menopausal transition stage versus in a late reproductive stage and being older were both associated with symptoms of incontinence.⁴⁴

Somatic symptoms

The MWMHP is the only source of prevalence estimates of aches or stiff joints for women in the various menopausal transition stages, with prevalence increasing from 41% in the late reproductive stage to 47% in early menopausal transition, to 53% in late menopausal transition, and to 57% at 2 years postmenopause.¹⁴ SWAN participants (n = 6,620 of >16,000) reported stiffness and soreness.¹⁵ Both increasing age and progression through the menopausal transition stages were associated with these symptoms.¹⁵

Severity and persistence of symptoms

A minority of women report severe symptoms.¹⁴ In the Norwegian Menopause Project, 67% of participants reported any hot flashes during the menopausal transition, 58% reported an increase in frequency from the reproductive stage to postmenopause, and 54% reported an increase in distress related to hot flashes.⁶ In the MWMHP, 39% of participants reported frequency and bothersomeness of hot flashes, with 29% of women in the menopausal transition stages and 37% of postmenopausal women reporting that hot flashes occurred several times per day.¹⁴ In the Penn Ovarian Aging Study, 26% of women reported their hot flashes were moderate to severe, with 15% experiencing hot flashes on >15 days per month and 9% reporting having hot flashes daily.¹⁰

Studies with trajectory data indicate that symptoms such as hot flashes peak in severity during the later part of the menopausal transition, when women are skipping menstrual periods.^{14,45-47} It is unclear whether and when symptoms

abate after menopause owing to limited follow-up. To date the longest reported follow-up of a cohort has been the MWMHP, which has reports based on 8 years of follow-up data.¹⁴

Women's attributions about symptoms and correlates in community-based population studies

Although there are only a few reports about women's attributions of their symptoms, the women's view of factors associated with their symptoms (ranging from hot flashes and sweats to aches and stiffness) correspond closely to findings from epidemiologic studies of community-based populations. Women attribute their symptoms to factors such as aging, menopausal hormone changes, family history, role overload, stress, health changes, emotional changes, attitudes and expectations, lack of information, and uncertainty about menopause.⁷ Epidemiologic studies link similar symptoms to factors including age; endocrine changes (estradiol, FSH, DHEAS, testosterone, androstenedione); stressors such as economic strain and parenting strain; stressful life circumstances such as abuse; health behaviors such as smoking, alcohol intake, exercise, and nutrient intake; personal characteristics such as optimism; concurrent and past health conditions, including prior episodes of depression or premenstrual symptoms; and physical indicators such as body mass index.^{14,15,40,46} Despite the wide range of factors associated with a wide array of symptoms, focus has remained on the role of endogenous endocrine factors such as estrogen.^{14,22}

Significance of symptoms in women's lives

Data from the MWMHP indicate little relation between symptoms (hot flashes, night sweats, vaginal dryness) and well-being.⁴⁸ Instead, well-being during the perimenopause was influenced by past well-being, changes in marital status, work satisfaction, daily hassles, and stressful life events. Moreover, in the MWMHP cohort, well-being improved as women entered the late menopausal transition stage. Data from studies of negative mood do indicate, however, that severe vasomotor symptoms affect sleep and mood and imply that these symptoms may interfere with women's well-being.²² The appraisal of the consequences of perimenopausal symptoms by women from different ethnic groups will be enhanced significantly as a result of the SWAN findings.⁴⁹⁻⁵³

State of the science, clinical implications, and future directions for research

The STRAW recommendations for staging the menopausal transition have prompted investigators to differentiate women's experiences across the reproductive aging stages. The

late menopausal transition and early postmenopausal stages appear to be intervals of vulnerability in which the prevalence of symptoms is higher than during other reproductive aging stages. This pattern has been observed in >1 study for hot flashes and sweats, vaginal dryness, and sleep disturbances. Depressed mood may increase in prevalence during the menopausal transition stages for a subset of women, but data about its persistence are limited.^{23–27} Difficulty sleeping seems to increase in a linear fashion over the menopausal transition and postmenopause, suggesting an association with increasing age as well as with prevalence of hot flashes and social factors.¹⁴ To date there is no evidence of cognitive symptoms, urinary incontinence, somatic/pain symptoms, or depressed mood peaking in any of the stages.

Understanding the various trajectories of symptoms in women (intraindividual analyses), coupled with between-groups analysis to reveal the joint effects of population and individual factors, remains to be accomplished. Most studies initiated in the 1990s have measured symptoms prospectively using standardized symptom checklists.^{1–12} Many have incorporated severity ratings, providing verbal descriptors that women can choose to indicate whether their symptoms are barely noticeable or extremely bothersome.^{7,9} Few have measured the frequency of symptoms. Little is known about whether and when each of the symptoms considered in this review will cease. Attempts to relate symptoms to hypothesized causal factors have included measures precisely timed to allow understanding of antecedent-consequent relationships: measures of endocrine levels have been timed to a specific day of the menstrual cycle and related to symptoms measured at the same time or shortly thereafter.^{7,12}

Conceptual framework for studying perimenopausal symptoms

Research on symptoms during the perimenopause can be strengthened by use of a conceptual framework that bridges emphasis on the genetic, molecular, and physiologic factors hypothesized to cause symptoms as well as the social and cultural context in which women experience them. A proposed conceptual framework builds on earlier work addressing symptom perception, evaluation, and response (**Figure 1**). Symptoms such as hot flashes are sensations that people perceive that differ from the ordinary. Perception and evaluation of symptoms precede response to symptoms. Symptom perception refers to noticing symptoms, their frequency, and their intensity, whereas symptom evaluation refers to judgments individuals make about symptoms, such as the degree of seriousness, treatability, causes, and consequences in their lives.⁵⁴ People use culturally based explanatory models—a set of professional, lay, or idiosyncratic categories—to ascribe meaning to their symptoms.⁵⁵ Responses to symptoms may include feelings, thoughts, or behaviors, such as self-care efforts (e.g., changing dietary intake, using herbal or over-the-counter preparations), seek-

ing help or advice from one's social network, seeking help from a health professional that may include a prescribed medication, or choosing to do nothing about the symptoms. The processes of symptom perception, evaluation, and response occur within a social context that shapes the meanings individuals ascribe to their symptoms as well as to their responses.^{54,55} Such a framework will enhance the efforts of clinicians and researchers to understand the experiences of women from various ethnic groups, such as those reflected in SWAN, and will contribute important insights on symptom management for women in the menopausal transition.^{49–53}

Summary: perimenopausal symptoms

The prevalence of hot flashes, night sweats, vaginal dryness, and sleep disruption increases beginning with the late menopausal transition stage and persists postmenopause. Nearly 40% of women are bothered by hot flashes during the late menopausal transition and postmenopausal stages. Sleep problems seem to increase in a linear fashion across the menopausal transition and postmenopausal stages. Vaginal dryness becomes more prevalent during the postmenopause than during the late reproductive and early and late menopausal transition stages, as do other sexual symptoms. It is unclear whether problems with depressed mood, urinary control, cognitive functioning, and joint and muscle aches and pains vary across the menopausal transition stages. Severity of symptoms (hot flashes, night sweats, vaginal dryness, and sleep problems) increases during the late menopausal transition stage and postmenopause, but owing to the availability of limited follow-up data, it is unclear how long symptoms persist postmenopause. Women attribute their symptoms to a variety of factors, including hormone changes, aging, role overload, stress, health changes, and emotional changes; epidemiologic studies link symptoms to aging, endocrine, genetic, psychosocial, cultural, behavioral, and health history factors.

Clinical implications

Although there is growing evidence about the relation of symptoms to endocrine levels, factors other than endocrine changes should be considered in diagnostic workups and symptom management plans. Not everything that women experience during the menopausal transition can be attributed to menopause. Menopause-related health consultations provide an opportunity to promote healthy aging.

Future research directions

Greater attention needs to be focused on the longitudinal analyses of the data from the cohorts studied to identify

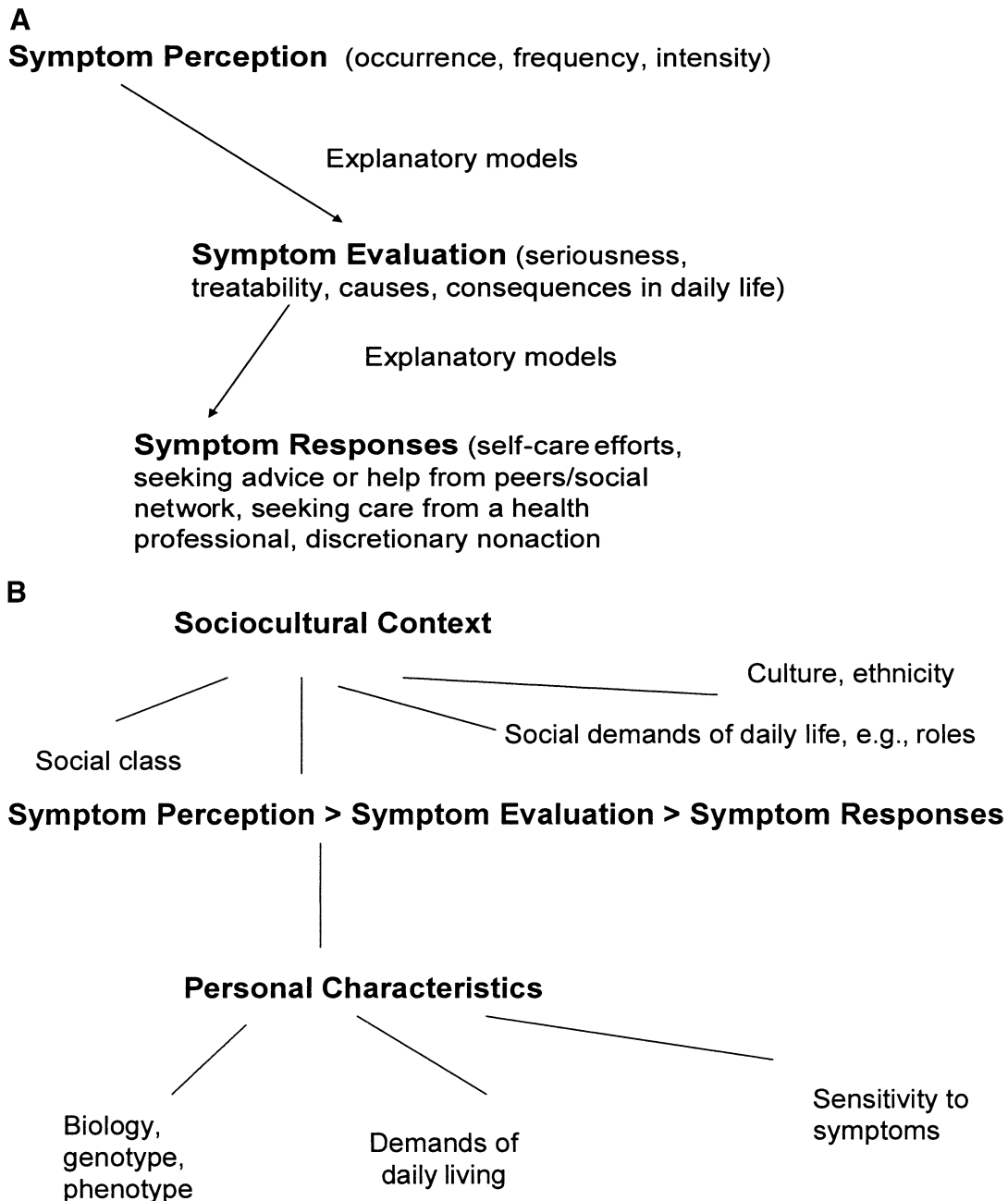


Figure 1 Conceptual model for understanding perimenopausal symptoms. (A) Symptom perception, symptom evaluation, and symptom responses are components of the process by which symptoms influence responses and are, in turn, influenced by explanatory models. (B) Symptom perception, evaluation, and responses are influenced by sociocultural context and personal characteristics.

within-woman patterns of symptoms over time, from the late reproductive stage through the postmenopause. In particular, longitudinal analyses of individual symptom clusters (e.g., vasomotor, sleep disturbances, depressed mood, sexuality), their trajectories, and their interrelation over time are needed. These analyses should be correlated to endocrine measures where available. Identification of women who have high levels of many symptom clusters should be pursued to determine whether there are important clinical correlates. Symptom clusters that are associated with high human and financial cost (e.g., de-

pressed mood, incontinence, and somatic pain) should receive special attention.

Increased emphasis on understanding the ethnic populations that have been studied and the meaning of symptoms within their cultures is needed as a basis for symptom management. Data are missing from menopause research about American Indian women, many Hispanic groups, Filipina American women, and Southeast Asian American women. Little attention has been focused on the early postmenopause, particularly the 5 years immediately after the FMP. SWAN will have the largest database of postmeno-

pausal symptoms and biomarkers and, along with other cohort studies, it will provide a rich resource for understanding persistence of hot flashes, sleep disturbances, depressed mood, sexual symptoms, and the link between the menopausal transition and healthy aging. Models that include social as well as biologic and behavioral correlates of perimenopausal symptoms are essential to achieve a full understanding of the mechanisms responsible for symptoms and to guide symptom management efforts. Longitudinal studies of women's experiences of symptoms, symptom evaluation, and responses to symptoms are needed to fully understand women's symptom management strategies. Evaluation of effects of symptoms (e.g., vasomotor and sleep disturbances, dysphoric mood) on well-being, role performance, and adaptation to demands of daily living are essential to fully understand the impact of perimenopausal symptoms in women's lives. These effects should be weighed against the effects of midlife events. It is not yet possible to depict the sequence of occurrence of these symptoms, but efforts to do so may help discern the time course of symptoms (e.g., whether hot flashes precede sleep disruption or vice versa).

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