Published in final edited form as:

Arch Womens Ment Health. 2014 December ; 17(6): 549–557. doi:10.1007/s00737-014-0444-5.

Persistence of Depression in African American and Caucasian Women at Midlife: Findings from the Study of Women Across the Nation (SWAN)

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Despite consistent findings that African Americans and Caucasians have similar point prevalence rates of psychiatric disorders (Breslau et al., 2005; Kessler et al., 2005; Kessler et al., 1994; Williams et al., 2007), recent studies indicate that African Americans with mood disorders were more likely to be persistently depressed. Williams and colleagues (2007), defined persistence as the ratio of 12-month depression to lifetime depression. This ratio was significantly higher among African Americans when compared to Whites. Breslau et al., (Breslau et al., 2006), considered depressive disorders persistent if the first onset of the disorder occurred at least two years prior to the study interview, and if the disorder was also present in the 12 months preceding the interview. Although African Americans had a lower lifetime risk of mood disorder when compared to Whites, African Americans with a lifetime mood disorder were more likely to be persistently ill than Whites. Williams et al., (Williams et al., 2007), also found that depressed African Americans and Caribbean Blacks were more likely to rate their major depressive symptoms as severe or very severe, and as more disabling than Whites.

Thus, racial/ethnic disparities may exist in the persistence of depressive disorders, and in the severity of depressive symptoms. Also, the sociodemographic and psychosocial factors associated with depressive symptoms in African Americans may differ depending on symptom severity (Lincoln et al., 2007). However, these studies rely on retrospective report over a relatively brief assessment period (12 to 24 months). Prospective data obtained over a longer period of time might give a more complete picture of the course of depression in African American and Caucasian women during midlife.

This paper will examine the course of depression during an 11-year period in African American and Caucasian women during midlife. It is hypothesized that: (1) African American and Caucasian women will have similar rates of lifetime syndromal and subsyndromal mood disorders at baseline; (2) compared to Caucasian women, African American women will demonstrate greater persistence or recurrence of mood disorders during the 11 years of follow-up. We will also characterize factors that predict persistence or recurrence of depression in midlife women, and determine whether these factors differ by race.

METHODS

Participants and Procedures

The study sample was obtained from the The Study of Women's Health Across the Nation (SWAN), a longitudinal, multi-site, community-based study of women's health at midlife. The original SWAN cohort of 3,302 women was enrolled at seven sites across the United States: Pittsburgh, Pennsylvania, Chicago, Illinois, Detroit, Michigan, Los Angeles and Oakland, California, and Newark, New Jersey. The design and sampling procedures for SWAN have been described in detail elsewhere (Sowers et al., 2000). Each site recruited women from a racial/ethnic minority group (i.e., African American, Hispanic, or Asian) and Caucasian women. Each site adhered to its Institutional Review Board's guidelines for human subjects' research. Eligibility criteria included: age 42-52, premenopausal or early perimenopausal, have an intact uterus and at least one ovary, have at least one menstrual period in the preceding three months, not pregnant, and not using any sex steroid hormone in the previous three months. Once enrolled, each woman completed baseline and annual assessments over an 11-year period. Baseline data collection occurred from 1996-1997, and follow-up assessments ended in January, 2009. Baseline and annual assessments included questions about medical, reproductive and menstrual history, psychosocial factors, and psychological symptoms.

The sub-sample for these analyses were obtained from the SWAN Mental Health Study (MHS), an ancillary study conducted at three sites (Pittsburgh, Chicago, and Newark) at baseline, with longitudinal data collected at the Pittsburgh site. Our sample comprises 423 women, who completed baseline and at least two consecutive follow-up assessments in the MHS over an 11-year period. Of the 463 women initially enrolled in the Pittsburgh SWAN cohort, 443 were enrolled in the MHS, 18 were missing all or some follow-up data, and 2 had only two non-consecutive follow-up visits.

Participants were administered the Structured Clinical Interview for DSM-IV (SCID) (First et al., 2010) to assess both lifetime and current psychiatric disorders at baseline, and annual assessments evaluated past month and past year diagnoses. All interviewers were initially trained in administration of the SCID by the Biometrics Research Department (New York State Psychiatric Institute), had at least a master's degree in a relevant field, and were supervised throughout the study by JTB. All interviews were audiotaped and demonstrated very good to excellent inter-rater reliability for major depression, both lifetime ($\kappa=0.81$) and past year ($\kappa=0.76-0.89$).

Baseline Demographic and Clinical Characteristics

Demographic characteristics assessed at baseline included age, race/ethnicity, education, employment status, difficulty paying for basics, and marital status. Education was classified as “high school degree or less, some college/vocational training, and college degree.” Employment status was defined as “employed versus not employed.” Participants rated financial strain by indicating “difficulty paying for basics” (i.e., “very, somewhat, or not very hard”). Marital status was categorized as “married/living as married versus not.” *Depressive symptom severity* was assessed with the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977). *Stressful life events* was evaluated with a list of 18 life events potentially occurring in the past year. *Perceived life stress* was assessed with the brief 4-item version of the Perceived Stress Scale (PSS) (Cohen et al., 1983). *Trait-anxiety* was assessed with 10 items from the State-Trait Personality Inventory (Spielberger, 1979). *Optimism*, a generalized expectation for favorable outcomes, was assessed with 6 items from the Life Orientation Test (Scheier and Carver, 1985b). *Private self-consciousness*, which measures the tendency to attend to one’s thoughts, feelings, attitudes, and internal bodily sensations, was assessed with the Self-Consciousness Scale—Revised (Scheier and Carver, 1985a).

Health-Related Variables

Lifetime medical conditions were assessed with the question “has a health care provider ever told you that you had the following condition” and included: anemia, diabetes, high blood pressure, arthritis/osteoarthritis, over/under active thyroid, heart attack/angina, cancer (other than skin), fibroids, and osteoporosis. *Menopausal status* (premenopausal, early perimenopausal) classification was based on menstrual bleeding patterns in the previous 12 months (WHO, 1996). *Body Mass Index (BMI)* was a continuous measure computed as weight in kilograms divided by height in meters squared. *Perceived Health* was measured with a single question with five response categories (“excellent” to “poor”), from the Medical Outcomes Study Short Form (MOS-SF-36) (Ware and Scherbourne, 1992). Additionally, participants completed the Role-Physical Functioning (problems with work or other activities due to physical health), Vitality (energy level), and Role-Emotional Functioning (problems with work or other activities due to emotional problems) scales of the MOS-SF-36. These scores were analyzed categorically, in which respondents falling into the lowest quartile were classified as having poor functioning (Avis and Colvin, 2007). Current medications and current psychotropic medications were reported and current use was verified by interviewers during clinic visits. *Sleep problems* were assessed with three questions (trouble falling asleep, waking during the night, early morning awakening) (Kravitz et al., 2008).

Depression and Anxiety Disorders

At baseline, current disorder (depression or anxiety) was that which occurred anytime in the previous month, while lifetime was defined as more than 12 months prior to the baseline interview. Follow-up SCID-diagnosed depressive disorder was categorized as none, subsyndromal, or major depressive episode in the past year (i.e., present at the time of interview or within the previous 12 months). The presence or absence of depressive disorder

over the 11-year period (i.e., depression profile) was categorized as follows: *None* (no syndromal or subsyndromal depressive episodes over the entire period); *Single* (one depressive episode over the period); *Recurrent* (syndromal or subsyndromal depressive episodes diagnosed at two or more annual visits, with at least one annual visit with no depression diagnosed in between each episode); or *Persistent* (two or more consecutive annual visits with syndromal or subsyndromal episodes diagnosed). Lifetime anxiety disorders included having one or more of the following: panic disorder, social phobia, specific phobia, agoraphobia, obsessive compulsive disorder (OCD), or anxiety disorder not otherwise specified (NOS) more than 12 months prior to the baseline interview or diagnosis of generalized anxiety disorder (GAD).

Analysis Plan

Because SCID evaluations identified the presence or absence of depression annually, it was not possible to determine whether mood symptoms had remitted during that time period, or how long symptoms lasted. Therefore, the categories “recurrent depression” and “persistent depression” were combined, and labeled “persistent/recurrent depression” throughout the manuscript. Measures of central tendency (means, standard deviations, median, inter-quartile range), and frequencies were used to describe baseline characteristics of the sample. T-tests, Wilcoxin tests, and Chi-square tests were used to examine differences in demographic, health, psychosocial, and clinical characteristics at baseline by race, and by depression profile as well as number and types of depressive episodes.

Using individual logistic regression analyses, each characteristic listed in Tables 1 and 2 was examined for its association with depression profile. Characteristics were then grouped by domain (i.e., demographic, clinical characteristics, health-related) and examined in separate multivariable models controlling for age and race/ethnicity. Characteristics associated with depression profile at $p < 0.055$ were then put into a single multivariable model (i.e., combining all three domains). Using a process of backward elimination to retain only characteristics that significantly distinguished persistent/recurrent depression versus single episode ($p < 0.05$), a final model was created. In order to examine potential race-related differences in risk factors for recurrent/persistent depression, additional logistic regression analyses were stratified by race^(Jones, 2001). The same process of examining each domain was followed separately to examine predictors of depression in African American and Caucasian women. Analyses were run using SAS (Version 9.3, SAS Institute, Inc., Cary, NC).

RESULTS

On average participants were 46 years old, and while there were no racial/ethnic differences in education or employment status, Caucasian women were less likely to report difficulty “paying for basics” when compared to African American women. A greater proportion of Caucasian women were married, compared to African American women. There were no racial differences in early perimenopausal status at baseline. Also, African American women reported less favorable overall health, more medical conditions, higher medication use, and higher body mass index than Caucasian women. Caucasian women reported higher use of

medication for “nerves or depression,” and the two groups did not differ in self-reported sleep problems, role physical or role emotional functioning (Table 1).

Assessment of psychosocial factors indicated no racial differences in number of very upsetting life events, perceived life stress, emotional role functioning, private self-consciousness or optimism. African American women reported lower trait anxiety than Caucasian women (Table 1).

Racial Differences in Depressive Symptoms Severity and Mood and Anxiety Disorders

No differences were evident between Caucasian and African American women in severity of depressive symptoms, presence of depressive or anxiety disorder in the past year, lifetime history of anxiety disorder or major depressive disorder. Chi-square analyses indicated that similar proportions of Caucasian and African American women were categorized as having “no depression” (51% vs. 45%, respectively); a “single episode of depression” (16% vs. 18%, respectively); or “persistent/recurrent episodes of depression” (32% vs. 38%). However, when compared to Caucasian women, a lower proportion of African American women had ever received treatment for emotional problems (65% vs. 43%, respectively, $p < .008$); had been treated with psychotherapy (36% vs. 20%, respectively, $p < .04$), and fewer tended to have been treated with psychotropic medication (36% vs. 25%, respectively, $p < .059$). Additionally, when the subsample of women with any depressive episodes was examined ($n=216$) in post-hoc analyses, a greater proportion of African American women than Caucasian women had 7 or more depressive episodes over the 11-year period (14% vs. 5%, respectively, $p < .02$).

Finally, there were no racial differences in the total number of visits with depressive episodes from baseline through follow-up 11, although statistically, Caucasian women had more visits overall. The median number of visits for both African American and Caucasian women was 12; interquartile ranges for both groups were [9, 12] and [10, 12], respectively ($p < 0.04$).

Differences in Clinical and Psychosocial Factors by Depression Profile

Compared to women with a single episode of depression, women with persistent/recurrent depression reported more severe depressive symptoms at baseline, and a higher percentage had lifetime depression, a depressive episode in the past year, lifetime anxiety disorder, and anxiety disorder in the past year (Table 2).

Univariate comparisons of health and psychosocial factors by depression profile also showed significant differences across the three groups. There were significant differences in age, perceived overall health, number of medical conditions, use of psychotropic medication, sleep problems, physical role functioning, vitality, emotional role functioning, number of very upsetting life events, perceived life stress, trait anxiety, and optimism (Table 2). These differences remained evident when using individual logistic regression models (data not shown).

Multivariate Analyses

Full Sample—Multivariable models of the full sample showed that baseline depressive symptom severity, sleep problems, and major life events were significant predictors of depression persistence. Thus, with each one unit increase in depressive symptoms there was a 5% increase in the odds of having persistent/recurrent depression. Those who reported sleep problems or two or more life events at baseline were approximately 2.5 times more likely to have persistent/recurrent depression at follow-up (Table 3). There were no statistically significant associations when comparing those with no depressive episodes to those with a single depressive episode (Table 3 and Table 4).

African American Women—For each one unit increase in depressive symptoms at baseline, African American had a 6% higher risk of persistent/recurrent depression at follow-up, and those who reported poor emotional role functioning at baseline had a 3.6 greater risk of having persistent/recurrent depression at follow-up.

Caucasian Women—Among Caucasian women, with each one-unit increase in optimism score there was a 10% decrease in the odds of having persistent/recurrent depression at follow-up. Women with low energy at baseline were 2.5 times more likely to have persistent/recurrent depression at follow-up, while those who reported sleep problems at baseline were at 2.7 times the risk of having persistent/recurrent depression at follow-up.

DISCUSSION

Persistence/recurrence of depression was examined in a community sample of Caucasian and African American mid-life women over an 11-year period. Contrary to earlier investigations (Breslau et al., 2005; Williams et al., 2007), no racial differences were evident in depression severity at baseline, or in rates of single, recurrent, or persistent depressive episodes. However, post-hoc analyses suggested that over the 11-year follow-up period, more African American women experienced 7 or more episodes of depression than Caucasian women. Our finding that at baseline, fewer African American women had sought help for mental health problems, or engaged in psychotherapy or pharmacotherapy, is consistent with prior literature documenting racial disparities in mental health service use (Gonzales et al., 2010; Olfson and Marcus, 2009). It also suggests that among the subgroup of women who experienced multiple depressive episodes, the absence of treatment for depression may have contributed to multiple recurrences in African American women. While intriguing, these post-hoc analyses must be considered preliminary and require replication, because our sample size did not permit more robust longitudinal analyses in this subgroup.

We identified predictors that distinguished midlife women with a single episode of depression over 11 years, from those who had experienced persistent/recurrent episodes. In addition, we found that these factors differed by race. These predictors included depressive symptom severity, sleep problems, functioning (energy and emotional role functioning), dispositional characteristics (private self-consciousness and optimism), and major life events.

In the full sample, our finding that an increased number of life events, increased depressive symptoms, and sleep problems, are associated with recurrence of depressive episodes, has clear documentation in patient populations and community samples.

Consistent with prior research linking stressful life events to the onset (Brown and Harris, 1978; Mazure et al., 2000) and recurrence of depression (Burcusa and Iacono, 2007), we found that midlife women who reported stressful life events at baseline were at higher risk for experiencing recurrent depressive episodes. In addition, subclinical depressive symptoms have been found to be a strong predictor of recurrence of depression in numerous studies (Hardeveld et al., 2010).

Epidemiologic studies of sleep disturbance have consistently found that rates of self-reported sleep problems are higher among women and these problems increase with age (Obayon, 2002). An earlier longitudinal examination of sleep problems in the SWAN study (Kravitz et al., 2008), found that sleep problems are prevalent among women during the menopausal transition, and identified racial differences in types of sleep problems.

Racial Differences in Risk for Depression Recurrence/Persistence

Our racially diverse sample permitted subgroup analyses, which permitted examination of salient risk factors for recurrence/persistence of depression that were specific to each racial group. Among Caucasian women, sleep problems, low energy, and dispositional optimism at baseline were the risk factors for persistent/recurrent depression. As previously noted, sleep problems increase during the menopausal transition, and in the SWAN cohort, Caucasian women were found to have more difficulty with sleep maintenance than African American women (Kravitz et al., 2008). This may put these women at higher risk for persistent/recurrent depressions during midlife. Functional difficulties are a key diagnostic feature of depression (First et al., 2010), and among Caucasian women in this sample, those associated with low energy were a key risk for persistence/recurrence of depression. Dispositional optimism is a trait-like characteristic that is defined as a general expectation for positive outcomes, even in the face of adversity. Women with persistent/recurrent depression were less likely to have higher levels of this trait. Research has demonstrated that optimism is associated with higher levels of engagement coping, and lower levels of avoidance (Carver et al., 2010). Further, optimism has been associated with decreased risk for development of depressive symptoms over time (Giltay et al., 2006); less severe depressive symptoms associated with stress. (Grote et al., 2007); and higher response rates to response to depression treatment (Tindle et al., 2012).

Depressive symptoms at baseline and the associated functional difficulties at work or daily activities were associated with persistent/recurrent depression among African American women. These key factors put these women at greater risk for future episodes of depression, and may be an important focus of preventive intervention. Depressive symptoms may be due to stress and may resolve with a person's usual coping strategies, they may be the result of a partially remitted depressive episode, or may indicate the recurrence of a new depressive episode. However, functional limitations (e.g., emotional role functioning) due to these symptoms might be indicative of a depressive syndrome that requires clinical attention rather than "stress."

Epidemiological and Clinical Implications

Depression has been defined as a recurring and relapsing disorder (Frank et al., 1990), and our findings among midlife women support the existing literature. Further, our findings that risk factors for depression did not differ significantly between women who had a single depressive episode and those who had none are consistent with the extant literature on the course of clinical depression (Burcusa and Iacono, 2007). In fact, research has demonstrated that approximately 50% of individuals who experience depression will not go on to have additional episodes. Thus, in order to reduce the prevalence of depression, preventive intervention efforts might focus on prevention of recurrent episodes of depression through appropriate screening and treatment to remission.

Women who experienced persistent/recurrent depression were more likely than those with a single episode to have had prior episodes of depression and/or anxiety. Education about depression at midlife can be a key first step in prevention of depression persistence. Midlife women may erroneously attribute sleep problems, fatigue, and life stress to midlife transition (even if they've had depression in the past), and not seek evaluation and treatment. Health professionals treating midlife women for other health conditions are in a unique position to evaluate depression using brief screening tools, to educate women about the symptoms of depression, its relapsing and recurrent nature, and the importance of seeking appropriate evaluation and treatment. These initial educational efforts may be particularly important in engaging African American women, who may be less likely to initiate and remain in depression treatment.

Some women may prefer medication for anxiety and depressive symptoms. For those who prefer counseling or psychotherapy, there are a number of empirically-validated therapies and strategies for clinical depression and subclinical symptoms of depression.

For example, intervention strategies that focus on some of the specific risk factors identified in this analysis might include: (a) education about sleep hygiene and medication evaluation for persistent sleep problems (Chen et al., 2010); (b) empirically-validated therapies such as cognitive behavioral therapy (CBT) (Butler et al., 2006) can be implemented to help women to enhance adaptive attributions like optimism (Carver et al., 2010); (c) self-activation strategies are often helpful in coping with the functional effects of fatigue (Simon, 2006); and (d) the development of more adaptive coping strategies through the use of CBT (Butler et al., 2006), Problem-Solving Therapy (PST) (Bell and D'Zurilla, 2009), or Interpersonal Psychotherapy (IPT) (Cuijpers et al., 2011), can be utilized to help women cope with life stress and the emotional sequelae of depression.

Limitations of this investigation include the absence of information on type of treatment (medication, psychotherapy), duration of treatment, and treatment dose (i.e., medication dose, frequency of psychotherapy). Also, annual evaluations of depression were unable to ascertain the specific timing and duration of depression episodes, thus making it necessary to combine the categories of recurrent depression and persistence of depression.

ACKNOWLEDGEMENTS

The Study of Women's Health Across the Nation (SWAN) has grant support from the National Institutes of Health (NIH), DHHS, through the National Institute on Aging (NIA), the National Institute of Nursing Research (NINR) and the NIH Office of Research on Women's Health (ORWH) (Grants NR004061; AG012505, AG012535, AG012531, AG012539, AG012546, AG012553, AG012554, AG012495). The content of this article is solely the responsibility of the authors and does not necessarily represent the official views of the NIA, NINR, ORWH or the NIH. Supplemental funding from The National Institute of Mental Health is also gratefully acknowledged. Clinical Centers: University of Michigan, Ann Arbor – Siobán Harlow, PI 2011, MaryFran Sowers, PI 1994-2011; Massachusetts General Hospital, Boston, MA – Joel Finkelstein, PI 1999 – present; Robert Neer, PI 1994 – 1999; Rush University, Rush University Medical Center, Chicago, IL – Howard Kravitz, PI 2009 – present; Lynda Powell, PI 1994 – 2009; University of California, Davis/Kaiser – Ellen Gold, PI; University of California, Los Angeles – Gail Greendale, PI; Albert Einstein College of Medicine, Bronx, NY – Carol Derby, PI 2011, Rachel Wildman, PI 2010 – 2011; Nanette Santoro, PI 2004 – 2010; University of Medicine and Dentistry – New Jersey Medical School, Newark – Gerson Weiss, PI 1994 – 2004; and the University of Pittsburgh, Pittsburgh, PA – Karen Matthews, PI. NIH Program Office: National Institute on Aging, Bethesda, MD – Sherry Sherman 1994 – present; Marcia Ory 1994 – 2001; National Institute of Nursing Research, Bethesda, MD – Program Officers. Central Laboratory: University of Michigan, Ann Arbor – Daniel McConnell (Central Ligand Assay Satellite Services). Coordinating Center: University of Pittsburgh, Pittsburgh, PA – Kim Sutton-Tyrell, PI 2001 – present; New England Research Institutes, Watertown, MA – Sonja McKinlay, PI 1995 – 2001. Steering Committee: Susan Johnson, Current Chair Chris Gallagher. We thank the study staff at each site and all the women who participated in SWAN.

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Table 1
Sample Characteristics at Baseline, by Race/Ethnicity (n=423)

Characteristics	African American (n=146)	Caucasian (n=277)	P-Value
Age (years), Mean $\pm$ SD	46.0 $\pm$ 2.5	46.2 $\pm$ 2.6	0.57
Education, n (%)			0.41
High school degree	36 (25)	64 (23)	
Some college / vocational training	59 (40)	98 (35)	
College degree	51 (35)	115 (42)	
Currently working, n (%)	125 (86)	229(83)	0.53
Paying for basics, n (%)			0.0001
Very hard	18 (12)	11 (4)	
Somewhat hard	47 (32)	63 (23)	
Not very hard	80 (55)	203 (73)	
Married, n (%)	58 (40)	225 (81)	<0.0001
Depressive symptom severity ^c , range 0-60, Median [IQR]	8 [3, 18]	9 [3, 15]	0.42
Very upsetting life events, n (%)			0.19
None	61 (42)	141 (51)	
One	38 (26)	56 (20)	
Two or more	46 (32)	80(29)	
Perceived life stress ^d , range 4-20, Median [IQR]	9 [6, 11]	8 [6, 11]	0.64
Trait anxiety ^e , range 0-30, Median [IQR]	5 [1,11]	7 [3, 12]	0.01
Optimism ^f , range 0-18, Median [IQR]	14 [11, 16]	14 [10, 16]	0.40
Private self-consciousness ^g , range 0-30, Mean $\pm$ SD	16.8 $\pm$ 4.6	16.0 $\pm$ 4.8	0.11
Medical conditions ^h ever, n (%)	122 (84)	182(66)	0.0001
Early perimenopausal status, n (%)	69 (47)	131(48)	0.91
Body mass index, Mean $\pm$ SD	31.2 $\pm$ 6.9	27.8 $\pm$ 6.0	<.0001
Perceived overall health, n (%)			<0.0001
Excellent	18 (12)	83 (30)	
Very good	57 (39)	130 (47)	
Good	53 (37)	55 (20)	
Fair / Poor	17 (12)	7 (3)	
Low role physical functioning ⁱ , n (%)	47 (32)	69 (25)	0.11
Low vitality/energy level ^j , n (%)	43 (29)	81 (29)	0.96
Low role emotional functioning ^k , n (%)	51 (35)	94 (34)	0.84
Current medications, ^l n (%)	42 (30)	38 (14)	0.0001

Characteristics	African American (n=146)	Caucasian (n=277)	P-Value
Medication for nerves/depression, n (%)	10 (7)	42 (15)	0.01
Sleep problems, n (%)	48 (33)	83 (30)	0.54
Depression in the past year, n (%)			0.35
None	130 (89)	258 (93)	
Subsyndromal	10 (7)	12 (4)	
Major	6 (4)	7 (3)	
Lifetime history of depression, n (%)	46 (32)	105 (38)	0.19
Depression profile, n (%)			0.41
None	65 (45)	142 (51)	
Single	26 (18)	45 (16)	
Persistent / Recurrent	55 (38)	90 (32)	
Anxiety disorder in the past year, n (%)	16 (11)	32 (12)	0.85
Lifetime history of anxiety disorder, n (%)	34 (23)	71 (26)	0.60

^a Abbreviations: IQR, interquartile range; SD, standard deviation.

^b Ns for each characteristic vary slightly because of random missing data.

^c Center for Epidemiologic Studies Scale-Depression

^d Perceived Stress Scale

^e State-Trait Personality Inventory

^f Life Orientation Test

^g Self Consciousness Scale-Revised

^h Medical conditions included, anemia, diabetes, high blood pressure, arthritis/osteoarthritis, over/under active thyroid, heart attack/angina, cancer (other than skin), fibroids, and osteoporosis.

ⁱ Medical Outcomes Study-Short Form 36, Role Physical Functioning Scale

^j Medical Outcomes Study-Short Form 36, Vitality Scale

^k Medical Outcomes Study-Short Form 36, Role Emotional Functioning Scale

^l Included currently taking medications to treat diabetes, high blood pressure, arthritis, heart attack/angina, cancer (other than skin), fibroids, and osteoporosis.

Table 2
Sample Characteristics at Baseline by Depression Profile (N=423)

Characteristics	No Event (n=207)	Single (n=71)	Persistent/ Recurrent (n=145)	P-Value
Age, years, Mean± Standard Deviation	46.5±2.7	45.7 ±2.3	45.8±2.4	0.03
African American, n (%)	65 (31)	26 (37)	55 (38)	0.41
Education, n (%)				0.24
High school degree	58 (28)	16 (23)	26 (18)	
Some college/vocational training	73 (35)	29 (41)	55 (38)	
College degree	76 (37)	26 (37)	64 (44)	
Currently working, n (%)	177 (86)	62 (87)	115 (80)	0.22
Married, n (%)	146 (71)	44 (62)	93 (64)	0.28
Paying for Basics, n (%)				0.10
Very hard	10 (5)	3 (4)	16 (11)	
Somewhat hard	50 (24)	22 (31)	38 (26)	
Not very hard	147 (71)	46 (65)	90 (63)	
Any Medical conditions* ever, n (%) ¹	133 (64)	52 (73)	119 (82)	0.001
Current Medications, n (%) ²	34 (17)	16 (24)	30 (22)	0.31
Medication for nerves/depression, n (%)	11 (5)	7 (10)	34 (23)	< 0.0001
Sleep problems, n (%)	57 (28)	13 (18)	61 (42)	0.0006
Low role physical functioning, n (%) ³	38 (18)	20 (28)	58 (40)	< 0.0001
Low vitality/energy, n (%) ⁴	45 (22)	17 (24)	62 (43)	< 0.0001
Low role emotional functioning, n (%) ⁵	39 (19)	25 (35)	81 (56)	< 0.0001
Very upsetting life events, n (%)				< 0.0001
None	117 (57)	37 (52)	48 (33)	
One	45 (22)	18 (25)	31 (21)	
Two or more	44 (21)	16 (23)	66 (46)	
Perceived stress (range 4-20), Median [IQR] ⁶	8 [6, 10]	9 [6, 11]	9 [7, 12]	<0.0001
Private self-consciousness [range 0-30] ⁷	15.3 ± 4.5	16.2 ± 4.7	17.6 ± 4.7	< 0.0001
Trait anxiety [range 0-30], Median (IQR) ⁸	5 (1, 9)	6 (2, 11)	9 (5, 15)	< 0.0001
LOT optimism scale [range 0-18] ⁹	14 (11,17)	14 (11,17)	12 (9, 15)	0.0005
Overall health, n (%)				0.01

Characteristics	No Event (n=207)	Single (n=71)	Persistent/ Recurrent (n=145)	P-Value
Excellent	64 (31)	18 (25)	19 (13)	
Very good	85 (41)	31 (44)	71 (49)	
Good	47 (23)	19 (27)	42 (29)	
Fair/Poor	9 (4)	3 (4)	12 (8)	
Early perimenopausal status, n (%)	96 (47)	36 (51)	68 (47)	0.78
Body mass index, Mean $\pm$ SD	28.6 $\pm$ 5.9	28.3 $\pm$ 6.7	29.8 $\pm$ 7.2	0.16
Depressive symptom severity ¹⁰ , range 0-60, Median [IQR]	6 (2, 12)	7 (4, 14)	15 (6, 22)	< 0.0001
Lifetime depression, n (%)	43 (21)	21 (30)	87 (60)	< 0.0001
Depression in the past year, n (%)				< 0.0001
None	207 (100)	66 (93)	115 (79)	
Subsyndromal	0	4 (6)	18 (12)	
Major	0	1 (1)	12 (8)	
Lifetime anxiety disorder, n (%)	34 (16)	19 (27)	52 (36)	0.0002
Anxiety disorder in the past year, n (%)	16 (8)	7 (10)	25 (17)	0.02

¹ Medical conditions included, anemia, diabetes, high blood pressure, arthritis/osteoarthritis, over/under active thyroid, heart attack/angina, cancer (other than skin), fibroids, and osteoporosis.

² Included currently taking medications to treat diabetes, high blood pressure, arthritis, heart attack/angina, cancer (other than skin), fibroids, and osteoporosis.

³ Medical Outcomes Study-Short Form 36, Role Physical Functioning Scale

⁴ Medical Outcomes Study-Short Form 36, Vitality Scale

⁵ Medical Outcomes Study-Short Form 36, Role Emotional Functioning Scale

⁶ Perceived Stress Scale

⁷ Self Consciousness Scale-Revised

⁸ State-Trait Personality Inventory

⁹ Life Orientation Test

¹⁰ Center for Epidemiologic Studies Scale-Depression

Table 3
Multivariable Multinomial Logistic Regression Model (All Women, N=415)

Baseline Characteristics	Persistent/Recurrent vs. Single		No Episodes vs. Single		P-value Across All Depression Profiles ^a
	Odds Ratio (C.I.)	P-value	Odds Ratio (C.I.)	P-value	
Age (years)	1.05 (0.93, 1.19)	0.43	1.10 (0.9, 1.23)	0.11	0.25
African American (Caucasian ref.)	0.90 (0.48, 1.68)	0.73	0.86 (0.45, 1.43)	0.45	0.73
Sleep problems	2.61 (1.27, 5.35)	0.01	1.64 (0.82, 3.29)	0.16	0.02
Very upsetting life events					0.0504
1 event vs. None	1.39 (0.65, 2.97)	0.41	0.90 (0.45, 1.43)	0.81	0.37
2+ events vs. None	2.50 (1.18, 5.29)	0.02	1.13 (0.55, 2.34)	0.72	0.01
Depressive symptoms	1.05 (1.01, 1.08)	0.01	0.97 (0.93, 1.01)	0.09	<0.0001

^aDepression profiles: Persistent/recurrent depressive episodes, single depressive episode, and no depressive episodes during 12-year study period (12-year study period=baseline + 11 follow-up visits)

Table 4
Multivariable Multinomial Logistic Regression Models in African American and Caucasian Women

Model 1. African American Women (N=146)	Persistent/Recurrent vs. Single		No Episodes vs. Single		P-value Across All Depression Profiles ^a
	Odds Ratio (C.I.)	P-value	Odds Ratio (C.I.)	P-value	
Baseline Characteristics					
Age (years)	0.94 (0.76, 1.17)	0.60	1.09 (0.91, 1.31)	0.36	0.28
Poor role emotional	3.62 (1.13, 11.61)	0.03	0.78 (0.23, 1.31)	0.69	0.004
Depressive symptoms	1.06 (1.00, 1.13)	0.049	0.97 (0.91, 1.04)	0.36	0.003
Model 2. Caucasian Women (N=269)					
Baseline Characteristics					
Age (years)	1.09 (0.93, 1.27)	0.29	1.12 (0.97, 1.29)	1.29	0.29
Sleep problems	2.72 (1.10, 6.68)	0.03	0.91 (0.38, 2.18)	0.83	0.048
Poor vitality / energy	2.41 (0.99, 5.88)	0.053	0.97 (0.88, 1.07)	0.57	0.006
Optimism	0.90 (0.81, 0.995)	0.04	1.52 (0.64, 3.59)	0.34	0.04

^a Depression profiles: Persistent/recurrent depressive episodes, single depressive episode, and no depressive episodes during 12-year study period.