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Depressive Symptoms Increase Risk of HIV Disease Progression and Mortality Among Women in Tanzania

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Summary:

The effect of depression on HIV disease progression was examined among 996 HIV-positive Tanzanian women participating in a trial on micronutrients and pregnancy outcomes, vertical transmission, and disease progression. Depression and social support were measured 2 months after HIV screening and every 6 to 12 months thereafter. Depression measures from pregnancy and more than 12 months postpartum were included in this analysis. Participants' clinical condition and access to supportive individual or group counseling was assessed throughout the 6 to 8 years of follow-up. Cox proportional hazard models were used to estimate the time-varying effect of depression on progression to HIV clinical stage III/IV (World Health Organization) and all-cause mortality. Participation in group or individual counseling and baseline social support were also examined. More than half (57%) of the study sample had symptoms comparable with depression at least once during the follow-up period. Controlling for sociodemographic variables, psychosocial support, and clinical condition at enrollment, depression was associated with an increased risk of disease progression (HIV clinical stage III/IV [hazard ratio (HR) = 1.61, 95% confidence interval (CI): 1.28 to 2.03] and mortality [HR = 2.65, 95% CI: 1.89 to 3.71]). Depression is common among HIV-infected Tanzanian women and increases the risk of disease progression. Screening for depression and providing psychosocial interventions should be considered part of comprehensive HIV care.

Keywords

counseling; depression; HIV disease progression; pregnancy; social support; sub-Saharan Africa; Tanzania

More than 60% of the world's HIV-infected population lives in sub-Saharan Africa, and more than 70% of all deaths attributable to HIV/AIDS are in this region. Although the rate of new infections seems to be stabilizing in many African countries, the absolute number of people living with HIV/AIDS is growing. Women are disproportionately affected by the disease, representing 59% of all people living with HIV in sub-Saharan Africa, and this trend seems to be worsening. Recent survey data have shown that young women (aged 15–24 years) are 3 times more likely to be infected with HIV than men in the same age group.¹ Increasing access to antiretroviral treatment has been an important and urgent focus of HIV care programs and has led to renewed efforts to increase access to HIV testing.² As more people learn their HIV status, and in recognition of the long latent period of disease before antiretroviral (ARV) medications are required, factors related to HIV disease progression remain important to identify in order to design comprehensive HIV care services that meet the needs of people living with HIV.

A growing body of evidence linking psychosocial factors to immune suppression suggests that depression or stress may accelerate HIV disease progression.^{3–6} Depression may alter immune function through a variety of mechanisms, including reductions in killer lymphocyte cells^{7,8} and alterations in serotonin⁹ and norepinephrine function,¹⁰ which may be related to impaired neuroendocrine function.¹¹ Depression may also be indirectly related to disease progression through behavioral mechanisms, such as nonadherence to medical recommendations^{12,13} or reduced caloric intake resulting in wasting.^{14,15}

The prevalence of psychiatric disorders among HIV-infected women in sub-Saharan Africa is not well documented, but high rates of depressive symptoms have been reported among HIV-infected women in the United States,¹⁶ and a recent study of HIV-infected men and women in Uganda found that 47% reported depressive symptoms.¹⁷ Similarly, approximately one third of HIV-infected women studied in Rwanda experienced depressed mood, difficulties with sleep, and problems with performing their daily tasks. HIV-related concerns included worrying about relatives providing help with problems related to the disease, fear that a partner would not be supportive, fear of not having resources for their family's basic needs, and future care for their children.¹⁸

Many studies on depression and HIV have found an association between depressive symptoms and immunologic parameters of disease progression^{17,19,20} or HIV-related symptoms,^{21,22} but studies examining the relation longitudinally have produced conflicting results. Some have found no evidence that depression predicts increased progression of disease or mortality,^{19,23} whereas others report that depression predicts a more rapid decline of CD4 lymphocyte counts²⁴ and shorter time to AIDS.²⁵ Two studies among large cohorts of HIV-infected US women have shown that chronic depressive symptoms were associated with an increased risk of mortality.^{17,26}

A recent review of the role of psychologic variables on progression of HIV-1 concluded that strong evidence supported the biologic plausibility of the relation between depression and disease progression,⁴ but this has not been reliably shown in studies. The absence of consistent findings may be explained by the relatively small contribution of psychosocial factors to progression compared with the protective effect of HAART. In addition, there are

currently limited data on this relation from the developing world, and no studies to date have examined this association prospectively in a developing country setting. The purpose of this study is to examine the burden of depressive symptoms among HIV-positive women in Tanzania and to estimate the association between those symptoms and HIV disease progression among a cohort of HIV-infected pregnant women followed up to 8 years.

MATERIALS AND METHODS

This study was conducted within a randomized controlled trial on the effect of vitamin supplementation on pregnancy outcomes, vertical HIV transmission, and HIV disease progression. Women were offered HIV testing and were recruited into the trial from April 1995 to July 1997 at selected antenatal clinics in Dar es Salaam, Tanzania.²⁷ Of the nearly 14,000 pregnant women who consented to HIV counseling and testing, 1819 were found to be infected with HIV (13%) and 1078 were enrolled in the trial and followed monthly until June 2003. Primary endpoints of the parent study included vertical transmission rates, pregnancy outcomes, HIV disease progression, and mortality among enrolled women and their children born into the study. Women with at least 1 depression measure taken during pregnancy or more than 12 months postpartum were eligible for inclusion in this study (n = 996). Data from depression assessments conducted between delivery and 12 months postpartum were deleted from the data set to eliminate any potential bias attributable to postpartum depression.

Women were followed monthly, and later quarterly, until the study ended in 2003, approximately 6 to 8 years after their HIV diagnosis. At screening, baseline data on gestational age, maternal age, education, and occupation were collected on all women who consented to HIV testing. A medical history, clinical examination, and CD4 cell count were obtained at enrollment (FACSCount; Becton Dickinson, San Jose, CA). Stage of HIV disease was defined according to World Health Organization (WHO) criteria²⁸ using an algorithm based on a clinical examination and history of illness during the previous month. Women attended the clinic monthly for physical examinations until 2000, after which they were clinically assessed every 3 months. Survival and mortality data were collected through tracing participants if a clinic visit was missed. Women were classified as alive as of the date of contact if a home visitor reported that she spoke with or saw the participant at that time.

Approximately 2 months after enrollment, every 6 months until 2001, and every 12 months thereafter, a psychosocial questionnaire was administered to assess depression and/or anxiety symptoms.²⁹ The Hopkins Symptom Checklist (HSCL-25), designed to assess anxiety and depressive symptoms, includes a 10-item anxiety scale and a 15-item depression scale.³⁰ Based on a validation study of the HSCL-25 in this population, Kaaya et al³¹ reported that a subscale of only 8 items, with a recalibrated cutoff score for “caseness” at >1.06, showed high sensitivity (88%) and specificity (89%) in identifying clinical depression as determined by an interview with a psychiatrist using the Structured Clinical Interview for the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) to assess major depressive disorder.³² Therefore, depression was defined for this study using only 8 items from the 25-item scale and the revised cutoff score (Appendix).

The social support scale, based on the Duke University–University of North Carolina Functional Social Support Questionnaire,³³ was designed to measure functional dimensions of social support among patients in a primary care setting. A 10-item questionnaire derived from this scale reflects emotional and/or affective support and material and/or instrumental support (see Appendix). The depression and social support scales were translated into Kiswahili by a committee and were verified through independent back-translation.

Women were invited to come to the study clinic between scheduled examinations if they were ill or for individual or group counseling. A psychiatric nurse provided individual counseling in the clinic and facilitated a weekly support group. Counseling efforts were targeted to women who requested counseling, women who were referred from a research nurse or physician, or women who reported depressive and/or anxiety symptoms at semiannual psychosocial assessments. The support group was open to all study participants. The group focused on health maintenance, family support, safe HIV serostatus disclosure, and HIV prevention. The emphasis of the group was on peer support.

Cox proportional hazard regression models (SAS/STAT, version 8e; SAS Institute, Cary, NC) were used to examine the relative hazard of depression, baseline social support, and counseling interventions on HIV disease progression and mortality.³⁴ Depression was allowed to vary over time intervals using the Andersen-Gill Model. HIV disease progression was defined clinically as progression to WHO clinical stage III/IV and mortality. Covariates included baseline sociodemographic variables (age, education, occupation, and marital status) and clinical condition at enrollment as measured by WHO stage of disease and CD4 count (<200, 200–499, and ≥500 cells/μL).

Using the validated 8-item depression scale described previously, women were classified as “depressed” if they scored greater than the cutoff mean score of 1.06 for depressive symptoms at any time during pregnancy or more than 12 months postpartum. Depression was treated as a time-varying independent predictor in models predicting clinical disease progression and mortality. Participation in the peer support group or receipt of individual counseling was defined as “some” or “none,” only using measures taken before censorship. Level of social support was measured at the first psychosocial assessment approximately 2 months after enrollment. Women were classified as having low baseline social support if their scores fell within the lowest 10th percentile of the social support scale scores.

Women were censored from the mortality analysis on the date of death, on the date of last contact in the clinic, or on the date last seen at a home visit. Censorship from the staging analysis was at the last assessment of clinical stage. Women who were at stage III at their enrollment clinical examination were not included in the staging analysis (women at stage IV were not eligible for the study). Depression measures taken on the day of censorship or later were not included in the analysis. The time intervals were defined at 12 months.

The College Research and Publications Committee of Muhimbili University College of Health Sciences, the Ethical Committee of the National AIDS Control Program of the Tanzanian Ministry of Health, and the Human Subjects Committee of the Harvard School of Public Health approved the study.

RESULTS

A total of 996 women (of the 1078 enrolled in the larger trial) were eligible for inclusion in this analysis. Table 1 compares the characteristics of the 996 women eligible for inclusion in the analysis with those of the 823 women who screened HIV-positive but were not included in this analysis. Most of these women were not enrolled in the parent study ($n = 741$). The remaining women were not included in this analysis because they did not contribute a single depression measure ($n = 62$) because of moving out of the study area, withdrawal, or death or because they had depression measures only from the postpartum period ($n = 20$). There were no statistically significant differences between the 2 groups in the mean or frequency distributions of age, education, or marital status. The distribution of occupations among women who were included in this analysis compared with those excluded was significantly different ($P = 0.003$; see Table 1). Women included in the analysis were less likely to be employed in business.

The mean age of the women in the sample was 25 years, and the mean gestational age at HIV screening was 18 weeks (median = 19 weeks, range: 8–24 weeks). A large proportion (37%) of the women could be classified as having poor economic and food security according to their daily per capita expenditure on food (less than US \$0.75). Approximately three quarters (76%) of the women had completed 5 to 8 years of formal education, 73% were not employed outside the home, and nearly 90% were married or in a cohabiting relationship (see Table 1).

At enrollment, 82% of the women were classified with WHO clinical stage I disease, 17% were classified with WHO clinical stage II disease, and only 1% were classified with WHO clinical stage III disease. More than half (57%) had CD4 counts between 200 and 499 cells/ μ L, 12% had CD4 counts less than 200 cells/mL, and 31% had CD4 counts of 500 cells/mL or greater (Table 2).

The 996 HIV-infected women with at least 1 eligible measure of depression were followed for a median of 72 months, or 6 years (mean = 61 months, range: 2–98 months). The women completed a median of 5 depression assessments (mean = 5.1 assessments, range: 1–14 assessments). Nearly 57% ($n = 566$) scored greater than the cutoff for depression at least once during follow-up.

Nearly 20% of the women attended at least 1 group support session (median = 6 sessions, range: 1–68 sessions), and approximately 29% received individual counseling from a social worker (median = 5 sessions, range: 1–45 sessions; results not shown). The “counseling/group support” variable was defined as any participation in a support group or individual counseling (37%; see Table 2).

Because all study women had recently been told their HIV-seropositive status, we examined the prevalence of depressive symptoms at baseline, 2.5 months after posttest counseling, and found that nearly 43% ($n = 380$) of the 891 women with antenatal assessments were depressed at baseline. A similar proportion (45%) was depressed during follow-up at least 12 months after delivery. Among those who were ever depressed, more than one third (37%)

of the women scored greater than the cutoff for depression in both periods: antepartum and more than 12 months after delivery. A total of 312 (31%) women died during follow-up.

Progression to World Health Organization Stage III/IV Disease

Depression was associated with greater than a 60% increased risk of being diagnosed as having WHO clinical stage III/IV disease (hazard ratio [HR] = 1.61, 95% confidence interval [CI]: 1.28 to 2.03; Table 3). Univariate and multivariate estimates of this risk were similar, indicating limited confounding attributable to baseline clinical stage or CD4 cell count. Counseling or group attendance and low social support at baseline were not significantly associated with disease progression nor did their inclusion in the model affect the relation between depression and clinical progression. Low education was significantly associated with disease progression (<5 years: HR = 1.68, 95% CI: 1.10 to 2.58; 5–8 years: HR = 1.43, 95% CI: 1.02 to 2.01). Women working in offices seemed to be at increased risk (HR = 1.63, 95% CI: 1.02 to 2.58). Women working as professionals were at significantly lower risk of clinical progression (HR = 0.45, 95% CI: 0.22 to 0.92; see Table 3).

Immunologic status at enrollment was independently significantly associated with clinical progression during follow-up. Women who entered the cohort with a CD4 count less than 200 cells/ μ L were more than twice as likely to progress clinically compared with women with CD4 counts greater than 500 cells/mL (HR = 2.47, 95% CI: 1.77 to 3.46), and women with moderately low CD4 counts between 200 and 500 cells/ μ L were 42% more likely to progress clinically (HR = 1.42, 95% CI: 1.14 to 1.79).

Depression and Survival

In models predicting all-cause mortality, depression was associated with more than a 2-fold significant increased risk of death (HR = 2.65, 95% CI: 1.89 to 3.71), and this relation was independent of baseline stage of disease and CD4 cell count (Table 4). The lack of association between counseling or support group attendance and low social support persisted. Similar, but only marginally statistically significant effects associated with occupation were observed (office work: HR = 1.84, 95% CI: 0.95 to 3.54; professional work: HR = 0.26, 95% CI: 0.06 to 1.06). No effect of education was observed, so the variable was not included in the final multivariate model. Immunologic status at baseline was strongly associated with mortality (CD4 count <200 cells/mL: HR = 9.04, 95% CI: 5.23 to 15.62; CD4 count 200–499 cells/mL: HR = 3.13, 95% CI: 1.89 to 5.18).

DISCUSSION

This study is among the first to examine the role of depression on clinical disease progression and mortality among HIV-infected women in sub-Saharan Africa. We found a high prevalence of depressive symptoms (43%) among predominantly asymptomatic HIV-infected pregnant women approximately 2 months after they had learned about their HIV status, and more than half (57%) reported depression at least once during pregnancy or during the study follow-up period, defined as more than 12 months postpartum. These prevalence estimates of depression among Tanzanian women are remarkably similar to those

of a US cohort of HIV-infected women¹⁶ and are consistent with a cross-sectional assessment of depression among HIV-infected men and women in Uganda.¹⁷

After adjusting for clinical or immunologic predictors and sociodemographic correlates of disease progression, depressive symptoms among HIV-infected women were associated with a significant increased risk of clinical disease progression to WHO stages III and IV. Depression also was predictive of a greater than 2-fold increased risk of death. These findings support the hypothesis that depression is an independent predictor of HIV disease progression and mortality among HIV-infected women.

The effect of low social support at baseline did not modify the effect of depression on disease progression and mortality, and had no independent effect on the outcomes of interest. Counseling or support group attendance also was not associated with the outcomes of interest. This finding may be attributable to the fact that the study was not designed to define and test the effects of a psychosocial intervention on disease progression. Study staff actively referred women they identified to be at high psychosocial risk to these services, but the services remained open to all study women. As a result, the group of women receiving such services was likely to contain many self-selected women who actively sought to improve their psychosocial status as well as women who were depressed and reported low social support and/or stressful life situations.

Although this study did not identify positive effects of counseling on disease progression or mortality, there is a need for additional studies specifically designed to measure the effectiveness of different psychosocial interventions. Few studies have quantitatively examined psychosocial interventions in developing countries.³⁵ One exception is a recent study conducted in Uganda that reported high rates of recovery among depressed individuals after participation in a community-based 16-week program of group interpersonal therapy.³⁶ Another randomized trial in Tanzania is currently assessing the effectiveness of 6-weekly closed-group support sessions for recently enrolled women in a prevention of mother-to-child transmission (PMTCT) program (S. Kaaya, personal communication, 2006).

This study has demonstrated that a simple 8-item screening tool can reliably identify women who are depressed and at risk of disease progression. Because this is the first application of the shorter scale, we also ran univariate analyses defining depression according to the standard (western-validated) cutoff of 1.75 on all 25 items in the scale. Results were consistent with the results when depression was defined using the 8-item scale cutoff score calibrated to this population (progression to stage III+: HR = 1.97, 95% CI: 1.23 to 3.16; mortality: HR = 3.48, 95% CI: 1.99 to 6.09). These consistent findings strongly support the validity of the shorter scale as a screening tool for measuring depressive symptoms in this population and the observed effects of depression on HIV disease progression and mortality.

Examining the role of psychosocial factors on disease progression among women of reproductive age has immediate public health and public policy implications. Initiatives to scale up HIV screening of pregnant women to prevent vertical transmission of HIV are underway in Tanzania and many other countries.^{2,37,38} As a result, an increasing number of women of childbearing age are learning that they are infected with HIV and are usually in an

early stage of the disease when tested. They may participate in, and benefit from programs to prevent HIV transmission to their infants. But they must also face the task of coping with the knowledge of their HIV status and linking into long-term comprehensive care.³⁹ These women face substantial sources of stress, potentially leading to depression, such as the stigmatization of people living with HIV, disclosure, limited access to care, discontinuity of care, poor economic and/or food security, making difficult choices about infant feeding, and worrying about whether their child is going to become infected or not.

Public health interventions that identify and treat depression could slow the progression to AIDS and may potentially lower the overall psychosocial burden and suffering caused by HIV. These findings also have implications for recent initiatives to provide broader access to ARV medications in resource-poor settings. Interventions that can slow the progression of HIV delay the use of ARV medications and may allow programs to treat more patients and improve the overall quality of life for HIV-infected patients.

Still, our findings also pose significant challenges to PMTCT and other HIV care and support programs. How can such programs design, budget for, and provide effective interventions to identify and manage depression within resource-poor public health systems? In this study, although support group meetings were open to all study participants, fewer than 1 in 5 women attended and only 1 in 4 depressed women sought the services of individual counseling. Thus, despite the availability of such interventions and the fact that high-risk women were actively referred to them, levels of participation remained low. Barriers could simply be logistic, related to the timing of the group and individual support sessions, quality and/or privacy of the counseling space, or transport costs. Nevertheless, concerns about confidentiality, fear of HIV serostatus disclosure, and stigmatization may also inhibit full participation in counseling or peer support interventions among HIV-infected women.

Effective interventions for managing depressive symptoms urgently need to be identified and tested in appropriately designed trials targeting populations heavily burdened by HIV. Barriers to participation in psychosocial support mechanisms also need to be investigated further and addressed through operational research and programmatic experience.

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APPENDIX 1

Depression and Social Support Subscales

Depression Scale: Hopkins Symptom Checklist-Revised

The HSCL-revised is composed of a total of 8 items: 2 from the 10-item anxiety subscale and 6 from the 15-item depression subscale. The items are as follows:

- Feeling blue
- Feeling trapped or caught
- Difficulty in falling or staying asleep
- Worrying too much about things
- Heart pounding or racing
- Crying easily
- Feeling hopeless about the future
- Faintness, dizziness, or weakness

Each item is scored on a 4-point scale (1 = “not at all”; 2 = “a little”; 3 = “quite a bit”; and 4 = “extremely”). The scores are summed and divided by the number of items to obtain an average score ranging from 1 to 4.

Using a cutoff of scoring greater than 1.06, these 8 items together had 88% sensitivity and 89% specificity compared with a DSM-IV–based diagnosis of clinical depression (Structured Clinical Interview for the DSM-IV). The HSCL-revised items had higher sensitivity and specificity in the validation study when compared with the HSCL-15, with a revised cutoff of 1.03, and the HSCL-25, with a revised cut-off of 1.06. The standard cutoff of 1.75 for the HSCL-25 was found to be inappropriate for this study population; it resulted in extremely low sensitivity (35%).

Social Support Scale

Emotional (affective) support items included the following:

1. I get visits from friends and relatives.
2. I get useful advice about important things in my life.
3. I get chances to talk to someone about problems at work or with my housework.
4. I get chances to talk to someone I trust about my personal and family problems.
5. I have people who care what happens to me.
6. I get love and affection.

Material (instrumental) support items included the following:

1. I get help around the house.
2. I get help with money in an emergency.
3. I get help when I need transportation.

4. I get help when I am sick.

All items were scored on a 4-point scale (1 = “as much as I would like,” 2 = “less than I would like,” 3 = “much less than I would like,” and 4 = “never”), summed, and divided by 10 for a mean score. For this analysis, the individual scale scores were reversed before calculating the mean score, so that high scores reflected better social support. Women were then classified as having low social support if their total score was less than the 10th percentile.

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TABLE 1.

Description of the Study Cohort Compared With Women Who Screened HIV-Positive But Were Not Included in the Study Analysis

	Included in Analysis (n = 996)		Not Included in Analysis (n = 823)		<i>P</i> [*]
	N	%	N	%	
Age in years					0.77
<20	125	12.5	96	11.7	
20–24	402	40.4	349	42.4	
25–29	305	30.6	252	30.6	
30	164	16.5	126	15.3	
Education					0.27
None or 4 years	133	13.4	92	11.2	
5–8 years	760	76.3	634	77.0	
9 years	103	10.3	97	11.8	
Occupation *					0.003
No outside employment	726	72.9	582	70.7	
Professional	27	2.7	10	1.2	
Business	139	14.0	161	19.6	
Office	41	4.1	26	3.2	
Hotel/restaurant/other	63	6.3	44	5.3	
Marital status					0.136
Married monogamously	582	58.4	481	58.4	
Married polygamously	55	5.5	62	7.5	
Cohabiting	247	24.8	177	21.5	
Single	112	11.2	103	12.5	

* The frequency distributions were compared using the χ^2 test.

TABLE 2.

Description of Key Measures of Depression, Psychosocial Support, and Clinical Status for the Study Cohort (N = 996)

Depression and Social Support	N	%	Clinical Status	N	%
Depression					
None	430	43.2			
At least once	566	56.8			
Depression by follow-up time period			Clinical WHO stage at enrollment		
Antepartum (n = 891)	380	42.7	WHO stage I	815	81.8
Long-term follow-up (12 mo postpartum)	343	45.3	WHO stage II	171	17.2
			WHO stage III	10	1.0
“Persistence” of depression [*]			CD4 count at enrollment (cells/ μ L) [‡]		
Not depressed at either time	224	34.3	<200	117	12.4
Depressed at one time period	271	41.6	200–499	536	56.8
Depressed at both time periods	157	24.1	500	291	30.8
Social support [‡]			Counseling/group attendance		
Low (<10th percentile score)	117	12.0	None	623	62.6
Moderate (10–50th percentile)	382	39.2	At least once	373	37.4
High (>50th percentile score)	476	48.8			

^{*} Only 552 women with observations during pregnancy and more than 12 months postpartum were included.[‡] n = 975 women with social support measures at enrollment; n = 21 had missing values.[‡] n = 944 women with CD4 cell count measures at enrollment; n = 52 had missing values.

TABLE 3.

Depression, Counseling/Support Group Attendance, and Social Support as Predictors of Progression to WHO Stage III/IV HIV Disease in Univariate and Multivariate Analyses, n = 893*

	Univariate Relative Hazard (95% CI)	P	Multivariate Relative Hazard I (95% CI)	P	Multivariate Relative Hazard II (95% CI)	P
Depression	1.57 (1.26 to 1.97)	<0.0001	1.55 (1.23 to 1.95)	0.0002	1.61 (1.28 to 2.03)	<0.0001
Individual counseling/peer group						
Never	—	—	1.00	—	1.00	—
At least once			0.96 (0.79 to 1.17)	0.700	1.02 (0.84 to 1.25)	0.825
Baseline social support						
Low (<10th percentile)	—	—	1.22 (0.82 to 1.81)	0.332	1.11 (0.74 to 1.66)	0.604
Not low			1.00	—	1.00	—
CD4 ⁺ lymphocyte count (μL) at enrollment						
<200	—	—	—	—	2.47 (1.77 to 3.46)	<0.0001
200–499					1.42 (1.14 to 1.79)	0.002
500+					1.00	—
Educations (y)						
None/less than 5	—	—	—	—	1.68 (1.10 to 2.58)	0.017
5–8					1.43 (1.02 to 2.01)	0.039
9+					1.00	—
Occupation						
None outside the home					1.00	—
Office					1.63 (1.02 to 2.58)	0.039
Business	—	—	—	—	1.06 (0.81 to 1.38)	0.692
Professional					0.45 (0.22 to 0.92)	0.028
Restaurant /hotel					1.00 (0.47 to 2.12)	0.993
Other					0.77 (0.48 to 1.25)	0.294

* Of 996 women with depression measures, n = 893 were eligible for this analysis. Reasons for exclusion included the following: n = 16 did not have a clinical stage outcome defined, and n = 87 only had depression measures taken on or later than the date of censorship.

Depression, Counseling/Support Group Attendance, and Social Support as Predictors of Progression to Mortality in Univariate and Multivariate Analyses,
n = 996*

TABLE 4.

	Univariate Relative Hazard (95% CI)	P	Multivariate Relative Hazard I (95% CI)	P	Multivariate Relative Hazard II (95% CI)	P
Depression	2.41 (1.75 to 3.31)	<0.0001	2.59 (1.85 to 3.62)	<0.0001	2.65 (1.89 to 3.72)	<0.0001
Individual counseling/peer group						
Never	—	—	1.00	—	1.00	—
At least once			0.83 (0.61 to 1.13)	0.228	0.85 (0.62 to 1.16)	0.313
Baseline social support						
Low (<10th percentile)	—	—	0.88 (0.49 to 1.58)	0.680	0.93 (0.52 to 1.67)	0.810
Not low			1.00	—	1.00	—
CD4 ⁺ lymphocyte count (μL) at enrollment						
<200	—	—	—	—	9.04 (5.23 to 15.62)	<0.0001
200–499					3.13 (1.89 to 5.18)	<0.0001
500+					1.00	—
Occupation						
None outside the home					1.00	—
Office					1.84 (0.95 to 3.54)	0.070
Business	—	—	—	—	1.08 (0.71 to 1.64)	0.712
Professional					0.26 (0.06 to 1.06)	0.061
Restaurant /hotel					1.84 (0.75 to 4.52)	0.184
Other					1.64 (0.86 to 3.15)	0.135

* All women with at least 1 depression measure from before delivery or more than 12 months postpartum were eligible for this analysis (n = 996).