

Spiritual and Religious Resources in African American Women: Protection From Depressive Symptoms After Childbirth

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Abstract

Many women experience depressive symptoms after childbirth, and rates among African Americans are as high as 40%. Spirituality and religiosity are valued in African American communities, but their relevance to new mothers has not been empirically tested. We examined effects of religiosity and spirituality on trajectories of depressive symptoms during the year after childbirth. Data were collected by the Eunice Kennedy Shriver National Institute of Child Health and Human Development Community Child Health Network, which focuses on maternal-child health disparities. The sample consisted of 702 low-socioeconomic-status African American predominantly Christian women. Participants were interviewed in their homes throughout the year after a birth. Spirituality and religiosity each independently predicted changes in depressive symptoms, and low levels predicted increases over time. Effects of religiosity were mediated by a woman's spirituality. Religiosity and spirituality functioned as significant, interrelated protective factors in this study, which provides novel insight about lower-income African American women after childbirth.

Keywords

depression, religious beliefs, community-based research

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Postpartum depression (PPD) is a form of depression indistinct from major depression in symptoms but temporally specific and occurring within 6 months after childbirth. It affects half a million mothers in the United States each year (Horowitz & Goodman, 2005). PPD is defined as onset of major depressive disorder in the 4 weeks after childbirth (American Psychiatric Association, 2013). Conservative estimates of PPD in the United States range from 7% to 13% (Rich-Edwards et al., 2006), which makes it as prevalent as major depressive disorder among non-puerperal women. The consequences can be serious for mothers, infants, and families: Mothers with depressive symptoms after childbirth have difficulty returning to pre-pregnancy levels of employment and are more likely to experience relationship stress. PPD is also associated

with increased risk of poor infant-parent attachment and potential cognitive, psychological, and behavioral effects for offspring that are lifelong (Abrams & Curran, 2007). Given the consequences, it is critical to identify aspects of women's lives that may prevent or ameliorate depressive symptomatology and disorder during the postpartum period and to determine protective factors and those women for whom they are most beneficial.

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In the general population, religiosity and spirituality have been associated with lower rates of depression, although this research has not been studied systematically with respect to PPD. Religiosity and spirituality can be understood as dimensions of human experience that involve beliefs, practices, and experiences related to transcendent or sacred reality. Although interrelated, religiosity and spirituality are empirically and theoretically distinct. Religiosity involves behaviors related to organized traditions, whereas spirituality usually refers to beliefs and experiences. Many individuals identify as both religious and spiritual, but not all do (Miller & Thoresen, 2003). In our study, religiosity and spirituality are distinguished, and their associations with depressive symptoms are examined separately.

Religious and spiritual experiences are especially salient during and after pregnancy because many religious traditions attach spiritual significance to childbirth, parenthood, and family. In addition, religious rituals (e.g., baptism, *brit milah*) and decision making about the religious upbringing of children often accompany this important life period. Birth narratives and interviews with pregnant couples have indicated that many parents view childbirth through spiritual lenses and characterize pregnancy as sacred and a manifestation of God's will (Mahoney, Pargament, & DeMaris, 2009).

In general, African Americans have more active religious and spiritual lives than do other Americans; more than 80% identify as both religious and spiritual (Chatters, Taylor, Bullard, & Jackson, 2008). Religious institutions historically have been central in African American communities, thereby providing a context for education, support, affiliation, socialization, and personal growth. Analysis of large national surveys indicates that in comparison with Caucasians, African Americans have higher levels of organized and private religious and spiritual lives and endorse higher levels of importance of beliefs and closeness to God, when controlling for religious affiliation and sociodemographic variables (Taylor, Mattis, & Chatters, 1999). The robust religious and spiritual lives of many African Americans constitute a unique resource for coping with life stress.

In addition, influences on depression among African American women in the postpartum period should be identified because research has indicated that women of color may be at greater risk for PPD, when controlling for sociodemographic factors (e.g., Howell, Mora, Horowitz, & Leventhal, 2005). This disparity parallels that of health outcomes generally (Dunkel Schetter et al., 2013), although some studies have reported no ethnic differences in PPD or have attributed differences to socioeconomic disparities (e.g., Rich-Edwards et al., 2006; Wei, Greaver, Marson, Herndon, & Rogers, 2008). Interpretation of these findings is further complicated by existing evidence that African

Americans, overall, experience lower—not higher—rates of depression than do Caucasians (e.g., Gibbs et al., 2013) and by indications that endorsement of depressive symptoms may vary by race and culture (Breslau, Javaras, Blacker, Murphy, & Normand, 2008). It has also been proposed that lower rates may be explained by more effective coping resources among African Americans, such as those provided by strong religiosity and spirituality (Griffith, Neighbors, & Johnson, 2009).

Although there is little research on religiosity and spirituality as related to PPD, that which exists has suggested effects in general and specifically for African American women. For example, a prospective study of more than 300 Caucasian and African American women showed that religious participation during pregnancy predicted lower depressive symptoms at 6 weeks postpartum, and self-rated religiosity and spirituality were marginally predictive (Mann, McKeown, Bacon, Vesselinov, & Bush, 2008). However, cross-sectional studies have shown both positive and negative associations of religiosity and spirituality and depressive symptoms during pregnancy (Jesse & Swanson, 2007). Furthermore, African American women in particular may use religious and spiritual practices to cope with PPD, a supposition based on interviews that have documented that African American women used strategies of “keeping the faith” and prayer to handle sadness and depression after childbirth (Amankwaa, 2003).

In addition, we can build on the strong body of evidence that has shown that aspects of religiosity protect against nonpuerperal depression. A meta-analysis of 147 largely cross-sectional studies that involved 98,975 participants revealed an association between religiosity and depression with a mean correlation (r) of approximately $-.10$ (Smith, McCullough, & Poll, 2003). The majority of rigorous studies on religiosity and depression published after this meta-analysis also have reported a significant, inverse relationship (e.g., Baetz, Bowen, Jones, & Koru-Sengul, 2006). Research among African Americans has further indicated that higher religiosity and spirituality are associated with lower risk of depression, although studies of organizational religious involvement, including religious attendance, are inconsistent (e.g., Ellison & Flannelly, 2009).

The few studies on spirituality and depression have shown mixed effects. Some have demonstrated that spiritual experiences were related inversely to depression in adult samples (Mofidi et al., 2006) and that spiritual importance was associated prospectively with lower likelihood of major depression diagnosis (Miller & Wickramaratne, 2012). Two cross-sectional analyses revealed that specific aspects of spirituality, such as importance of spiritual values in adults, correlated with more—not fewer—depressive symptoms (Baetz et al., 2006; cf. Maselko, Gilman, & Buka, 2009). Thus, evidence

for spirituality as a protective factor against depression is inconsistent, whereas the negative relation of religiosity and depression is somewhat clearer.

Researchers have speculated extensively about pathways that mediate between religiosity/spirituality and mental health (e.g., Ellison & Flannelly, 2009; Smith et al., 2003). In particular, religious practices often involve social interaction and are reliably related to greater social support from others, which is a known resource against depression (cf. Marroquín, 2011). Thus, one set of mediators of effects of religiosity on depression may be social factors. In addition, it has been hypothesized that religious involvement can facilitate spiritual experiences that directly influence affective states; thus, associations between religiosity and depression could be mediated by spirituality (Koenig, King, & Carson, 2012).

Our premise was that both religiosity and spirituality would function protectively against symptoms of depression in a sample of low- and middle-income African American women during the postpartum period. This was tested prospectively with a large, multisite sample from several regions studied at three time points in the year after a birth. More specifically, we hypothesized that (a) spirituality would predict reductions in depressive symptoms over the postpartum period, controlling for sociodemographic factors and current religious affiliation; (b) religiosity would predict reductions in depressive symptoms over the postpartum period, controlling for sociodemographic factors and perceived social support; and (c) the effect of religiosity on changes in depressive symptoms over time would be mediated by spirituality.

Method

Overview of the Community Child Health Network (CCHN)

The current study was part of the CCHN, a community-based participatory research effort composed of collaborating sites in Los Angeles, Chicago, Washington, D.C., Baltimore, and eastern North Carolina (Dunkel Schetter et al., 2013). Mothers were screened for the following inclusion criteria: 18 to 40 years of age, ability to complete interviews in either English or Spanish, residence in one of the identified communities for at least 6 months, having four or fewer children including the new infant, and absence of plans to be surgically sterilized after childbirth. Trained interviewers conducted interviews in the home at three time points: 2 to 16 weeks (Time 1, T1), 6 to 10 months (Time 2, T2), and 12 to 15 months postpartum (Time 3, T3). Interviews included multiple measures of stress and resilience, physical and mental health, and sociodemographic information. The study protocol was approved by the review board of each participating site.

Sample

The current study involves a subsample of 702 African American mothers selected from the CCHN maternal cohort. Inclusion required primary self-identification as African American and self-description as either Christian or no religious affiliation; less than 5% of mothers had any other religious affiliation. Participants were mostly from Baltimore (33%), Washington, D.C. (29%), and North Carolina (26%) and fewer were from Chicago (6%) and Los Angeles (6%). Mothers were 25 years old on average with 12.7 years of education and had a mean per capita household income of \$10,336. A slight majority (56%) was below the federal poverty line, and only 22% of mothers had household incomes greater than 200% of the federal poverty level, with the other 22% falling in the middle (near poverty level). About two thirds of the women (64%) were in a relationship with the baby's father.

Measures

Religiosity and spirituality. At 6 months after childbirth (T2), participants were asked to indicate their religious backgrounds and current religious identification from a list of affiliations and denominations, including "no religion." We also administered questions adapted from the Fetzer Institute and the National Institute on Aging Working Group (NIA; 1999) Fetzer Multidimensional Measurement of Religiousness/Spirituality for Use in Health Research. These questions included, "To what extent do you consider yourself a religious person?" Responses were made on a 4-point scale from *not at all* to *very*. Participants with a current religious affiliation also answered, "How often do you usually attend religious services?" Responses were made on a 6-point scale from *never* to *4 or more times a week*. These two items were standardized and summed to form an indicator of religiosity ($r = .45$ between them). Religious attendance is commonly used as a single-item indicator of religiosity (Fetzer Institute & NIA, 1999; Koenig et al., 2012) and is moderately correlated with other measures of religiosity (Idler et al., 2003). Similarly, the first question about extent religious was developed for use in health research (Fetzer & NIA, 1999) and is commonly used as a single-item measure of religiosity in epidemiological studies (Idler et al., 2003). In the current sample, three sets of tests using other measures of religiosity and religious behavior, including future religious behaviors, provided evidence of validity of the two-item indicator of religiosity with Pearson r correlations of .4 to .6, all of which were highly significant.

At 6 months postpartum, participants were asked a series of questions about to what extent they find strength and comfort in their religion, feel deep inner peace or

harmony, and experience a divine presence in their lives; all responses were provided on a 6-point scale from *never or almost never* to *many times a day* (Fetzer & NIA, 1999). (Only currently affiliated participants who indicated that they attended religious services were asked the first question.) All participants also answered, "To what extent do you consider yourself a spiritual person?" Responses were made on a 4-point scale from *not at all* to *very*. These four items were standardized and summed to form a composite of spirituality with an alpha coefficient of .78. The first question (extent spiritual) is commonly used as a single-item indicator of spirituality in epidemiological studies (Idler et al., 2003). The three items about spiritual experiences come from the Daily Spiritual Experiences (DSE) scale of the Fetzer Multidimensional Measurement of Religiousness/Spirituality for Use in Health Research (Fetzer & NIA, 1999). Full and short versions of the DSE have shown content and divergent validity in various samples, including African American adults (Loustalot et al., 2011). In the current sample, this indicator was significantly associated with future spiritual experiences and behaviors.

Depressive symptoms. At T1, T2, and T3, the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) was administered. The EPDS is a validated screening instrument for use postpartum and consists of 10 items that pertain to the severity of common depressive symptoms experienced during the past 7 days, each answered on a scale with values from 0 to 4. Cronbach's alpha coefficients for the scale were above .80 at all time points. In addition, respondents were categorized on the basis of scores as not depressed (scores 0–8), possible depression (scores 9–12), or probable depression (scores > 12, or endorsement of suicidal thoughts).

Social support. At T3, participants were asked about perceptions of availability of emotional support ("someone to talk with about your problems" during the previous 3 to 4 months and "Do you have as much contact as you would like with someone you feel close to?"). These items are often used in social epidemiological research; participants provided yes/no responses, and the items were summed to create an emotional support index. Participants were also asked to what extent they agreed or disagreed with three statements on help from relatives; the statements are part of a subscale of a measure of familism that has been validated among Hispanic Americans and other ethnic groups (Schwartz, 2007). These items were summed to create an index of perceived family support.

Sociodemographic information. At study outset (T1), mothers provided their ages and ethnic/racial self-identifications, educational attainment, relationship

status with the baby's father, and income. A per capita index of annual income adjusted for household size was computed.

Data analysis

Bivariate correlations, *t* tests, and analyses of variance were computed to examine associations among predictors and covariates. As a result of significant associations among primary study variables, we treated relationship status and the two-item socioeconomic status (SES) index as covariates.

We predicted that religiosity and spirituality would be associated with reductions in depressive symptoms during the postpartum period. These hypotheses were tested using multilevel modeling to use data from repeated measures. Separate growth-curve models were estimated for religiosity and spirituality with the EPDS trajectory as the outcome. To test change in EPDS score over time, we entered time as a categorical variable at Level 1 with T1 as the reference category. At Level 2, we included the religiosity/spirituality predictor and covariates. Covariates and control variables were included as predictors of the intercept (i.e., baseline depressive symptoms). Because of similar results using years of education and per capita household income as covariates, these variables were standardized and summed to form an indicator of SES. The intercept and the slopes were allowed to vary randomly, and models were estimated using maximum likelihood. Our model specifications for spirituality and religiosity are as follows:

$$Y_{it} = \gamma_{00} + \gamma_{01}\text{Spirituality} + \gamma_{02}\text{Relationship Status} + \gamma_{03}\text{SES} + \gamma_{04}\text{Current Affiliation} + \gamma_{10}\text{T2} + \gamma_{11}\text{T2} \times \text{Spirituality} + \gamma_{20}\text{T3} + \gamma_{21}\text{T3} \times \text{Spirituality} + \mu_{0i} + \mu_{1i}\text{T2} + \mu_{2i}\text{T3} + e_{it}, \quad (1)$$

$$Y_{it} = \gamma_{00} + \gamma_{01}\text{Religiosity} + \gamma_{02}\text{Relationship Status} + \gamma_{03}\text{SES} + \gamma_{04}\text{Family Support} + \gamma_{05}\text{Emotional Support} + \gamma_{10}\text{T2} + \gamma_{11}\text{T2} \times \text{Religiosity} + \gamma_{20}\text{T3} + \gamma_{21}\text{T3} \times \text{Religiosity} + \mu_{0i} + \mu_{1i}\text{T2} + \mu_{2i}\text{T3} + e_{it}, \quad (2)$$

where *t* represents occasion *t*, *i* represents individual *i*, and *e* represents level 1 variance.

Mediation of the effect of religiosity on changes in depressive symptoms by spirituality was tested using a series of hierarchical linear regressions followed by a Sobel test of the mediated effect.

Although there are currently no accepted guidelines for reporting effect sizes for multilevel models, we

Table 1. Religiosity and Spirituality as Predictors of Change in Depressive Symptoms Over Time

Effect	Spirituality		Religiosity	
	Estimate	<i>f</i> ²	Estimate	<i>f</i> ²
Fixed effect				
Religiosity/spirituality predictor	-0.067 (0.06)		0.165 (0.11)	
Time (reference: Time 1)				
Time 2	0.291 (0.19)		0.290 (0.20)	
Time 3	-0.256 (0.21)		-0.248 (0.21)	
Time × Religiosity/Spirituality Predictor (reference: Time 1)		0.011		0.013
Time 2	-0.208*** (0.06)		-0.296** (0.11)	
Time 3	-0.138* (0.07)		-0.261* (0.12)	
Current religious affiliation	0.027 (0.33)		—	
Family support	—		-0.197** (0.06)	< 0.001
Perceived emotional support	—		-3.031*** (0.54)	0.002
Relationship status	-0.687* (0.30)	< 0.001	0.059* (0.29)	< 0.001
Socioeconomic status	-0.237 (0.15)		-0.379** (0.15)	< 0.001
Random effect				
Intercept variance	3.278 (0.19)		3.173 (0.19)	
Slope variance	0.182 (0.05)		0.176 (0.05)	

Note: Standard errors are shown in parentheses. All religiosity and spirituality items were coded such that higher scores are indicative of greater religiosity and spirituality. Cohen’s *f*² values provided for significant effects.
 p* < .05. *p* < .01. ****p* < .001.

reported Cohen’s *f*² values based on comparisons between models of residual error variance (see Table 1; Selya, Rose, Dierker, Hedeker, & Mermelstein, 2012). For other effects, Cohen’s *d* values are reported, and the completely standardized indirect effect is reported for the mediation (Feingold, 2009; Preacher & Kelley, 2011).

Results

Demographic characteristics

The means on the EPDS at 1, 6, and 12 months were 4.70, 4.96, and 4.43 (range = 0–30) with 8%, 10%, and 9% of participants’ scores indicating probable depression at the respective time points. Nearly two thirds of mothers identified with a Christian religious denomination, whereas 34% of the sample reported that they did not identify with any religious group. On the standardized indices, mothers’ scores were normally distributed with average spirituality and religiosity scores slightly above the midpoint and widely ranged (spirituality: *SD* = 3.2; religiosity: *SD* = 1.8). Family support and perceived emotional support ratings were high on average (spirituality: *M* = 11.1, range = 3–15; religiosity: *M* = 0.9, range = 0–1).

Bivariate correlations among study variables

Bivariate correlations indicated that depressive symptoms at all time points were significantly associated with key

study variables. Correlations of depressive symptoms with family support ranged from -.11 to -.14 (all *ps* < .01, all *ds* > 0.2), and correlations of depressive symptoms with perceived emotional support ranged from -.16 to -.18 (all *ps* < .001, all *ds* > 0.3). Spirituality and religiosity were significantly associated with each other, *r* = .57, *p* < .001, *d* = 1.4, thus sharing only 32% variance, and were associated as well with having a current religious affiliation (spirituality: *r* = .44, *p* < .001, *d* = 1.0; religiosity: *r* = .530, *p* < .001, *d* = 1.3), higher SES (spirituality: *r* = .24, *p* < .001, *d* = 0.5; religiosity: *r* = .22, *p* < .001, *d* = 0.5), and perceived emotional support (spirituality: *r* = .14, *p* < .001, *d* = 0.3; religiosity: *r* = .12, *p* < .01, *d* = 0.2). In addition, bivariate associations of these study variables with depressive symptoms showed that religiosity and spirituality were significantly correlated with lower EPDS scores at T2 (religiosity: *r* = -.09, *p* < .05, *d* = 0.2; spirituality: *r* = -.20, *p* < .001, *d* = 0.4) and T3 (religiosity: *r* = -.08, *p* < .05, *d* = 0.2; spirituality: *r* = -.15, *p* < .001, *d* = 0.3).

Spirituality and changes in depressive symptoms

We predicted that spirituality would be associated with a decrease in depressive symptoms over time. The pattern of results in Figure 1a shows individuals separated by degree of spirituality with all other covariates held constant at their means. Less spiritual mothers rated themselves as slightly spiritual on average and reported having spiritual

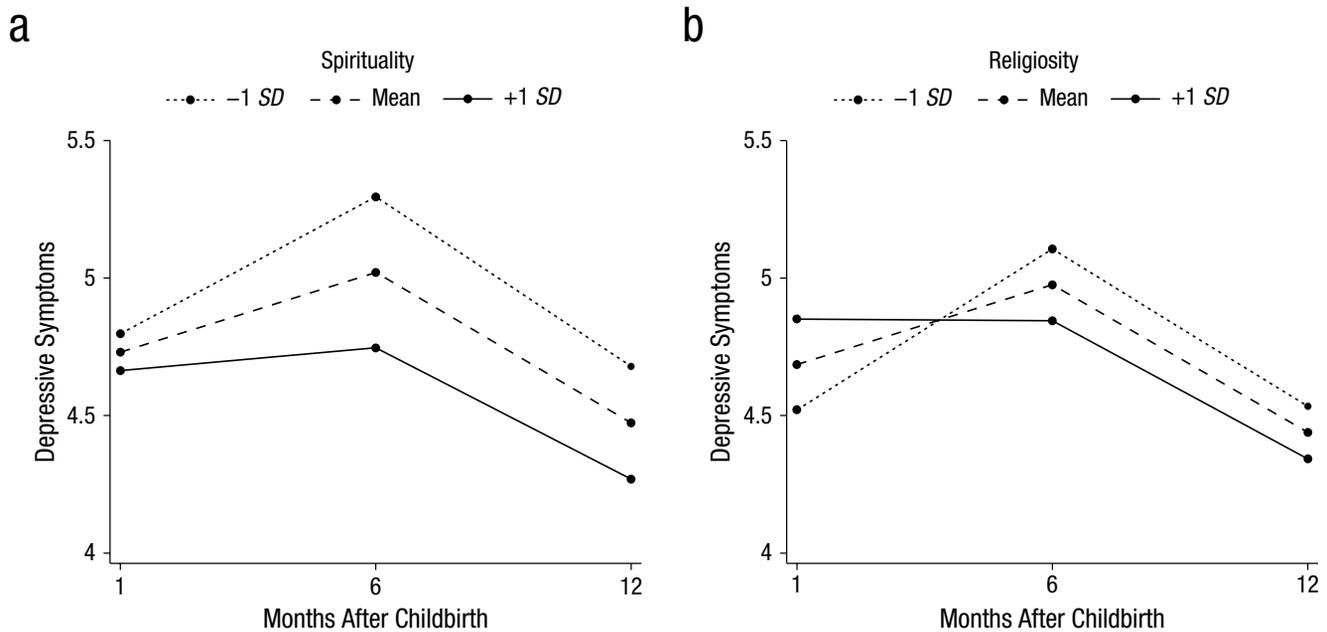


Fig. 1. Changes in depressive symptoms after childbirth as a function of spirituality (a) and religiosity (b).

experiences only once in a while; average and highly spiritual mothers rated themselves as moderately or highly spiritual and reported having spiritual experiences most if not every day. Growth-curve model results are shown in Table 1. There was a significant interaction between spirituality and time, $\chi^2(2, N = 703) = 11.36, p < .01, d = 0.3$. Tests of simple effects revealed that the change in depressive symptoms from 1 to 6 months postpartum differed by spirituality. Participants 1 SD below the mean in spirituality had a significant increase in depressive symptoms from 1 to 6 months after childbirth, change = 0.498, $z = 2.38, p = .02, d = 0.10$, and participants with spirituality at the mean or 1 SD above the mean had no change ($p > .13, d > 0.06$). Regardless of level of spirituality, participants had a significant decrease in depressive symptoms from 6 to 12 months postpartum.

Religiosity and changes in depressive symptoms

We predicted that religiosity would be associated with a decrease in depressive symptoms over time. The pattern of results is illustrated in Figure 1b with individuals separated by degree of religiosity and all other covariates held constant at their sample means. Less religious mothers reported attending services approximately once a year and indicated that they were not religious on average or were only slightly so; average and highly religious mothers rated themselves as moderately or very religious and reported attending services at least a few times a month. Results of the growth-curve model are shown in Table 1.

There was a significant interaction between religiosity and time, $\chi^2(2, N = 703) = 8.00, p = .02, d = 0.2$. Tests of simple effects revealed that the change in depressive symptoms from 1 to 6 months postpartum differed by level of religiosity. Participants 1 SD below the mean in religiosity had a significant increase in depressive symptoms from 1 to 6 months postpartum, change = 0.586, $z = 2.50, p = .01, d = 0.12$, and participants with religiosity at the mean or 1 SD above the mean had no change ($p > .14, d > 0.06$). Regardless of level of religiosity, participants had a significant decrease in depressive symptoms from 6 to 12 months postpartum.

Religiosity, spirituality, and changes in depressive symptoms

We conducted a series of linear regressions to test the hypothesis that spirituality would mediate the association of religiosity and change in depressive symptoms. Regressions revealed that religiosity was a significant predictor of spirituality, $\beta = 0.934, p < .001, f^2 = 0.39$. A second set of hierarchical linear regressions showed that religiosity was a significant predictor of favorable change in depressive symptoms from 1 to 6 months postpartum, $\beta = -0.203, p < .05, f^2 = 0.01$, after we included the sociodemographic covariates relationship status and SES in addition to support variables. A third set of hierarchical linear regressions revealed that when both spirituality and religiosity were included as predictors with support variables and sociodemographic variables as covariates, religiosity was no longer a significant predictor of changes

in depressive symptoms, $\beta = -0.001$, $p = .991$, $f^2 = 0.00$; however, spirituality was a significant predictor, $\beta = -0.220$, $p < .001$, $f^2 = 0.02$. Complete mediation was evidenced for spirituality as the religiosity estimate reduced to nonsignificance; the mediation effect was significant, $p < .001$, Sobel's $t = -3.82$, $ab_{cs} = -.21$. The women who attended religious services and rated themselves as more religious were more likely to rate themselves as highly spiritual and to have spiritual experiences; as a result, they did not have an increase in depressive symptoms. Religiosity did not significantly predict changes in depressive symptoms from 1 to 12 months postpartum or from 1 to 6 months postpartum; thus, mediation was not tested for these time periods.

Discussion

In a large cohort of low- to middle-income African American mothers, we found that those who were less religious and less spiritual evidenced an increase in depressive symptoms during the 6 months after the birth of a child, when we controlled for SES, relationship status, and other variables. In contrast to less religious and less spiritual mothers, those with robust religious and spiritual lives did not show an increase in depressive symptoms. These results affirm that religiosity and spirituality are particularly important resources for low-income African American women. Many resources that could help buffer mental-health difficulties are inaccessible to this population; thus, it is especially important to identify those resources that may be available during this vulnerable time. Religiosity and spirituality are both available, and past research has indicated that aspects of religiosity may buffer negative consequences of financial hardship (Bradshaw & Ellison, 2010).

We conceptualized and measured religiosity and spirituality with an eye to their distinction and found that each was an independent predictor of the changes in depressive symptoms during the postpartum period. That is, aspects of spirituality, such as daily spiritual experiences and self-rated spiritual identity, as well as components of religiosity, such as religious attendance and identity, predicted the trajectory of symptoms during the postpartum period. These effects began in the early postpartum period at 1 month—a time at which depressive symptoms are quite variable but also most prevalent (Cooper & Murray, 1995). These findings clarify the previously equivocal findings on the direction of the association between spirituality and depression. Furthermore, the observed effects of religiosity on changes in depressive symptoms during the first 6 months postpartum appear to be mediated by spirituality. In this study, we also sought to address the hypothesis that benefits of religiosity reflect benefits of social support by controlling

for emotional and family support. However, as in other studies, we did not find that social support fully explained the association of religiosity and mental health; a more likely mediating support process is that of support from fellow religious-group members or in religious contexts specifically (George, Ellison, & Larson, 2002).

The longitudinal design of this study allowed for analyses and conclusions about changes in PPD symptoms that have not often been studied. Yet because religiosity and spirituality were measured at 6 months postpartum, reverse causality may be a concern, namely, if changes in depressive symptoms during the study promoted higher religiosity or more spiritual experiences. Another limitation is measurement of key variables by self-report, such that common method variance may contribute to the associations reported. However, it is difficult to objectively assess religious and spiritual phenomena, given that they are inherently intrapsychic. In addition, the DSE scale has demonstrated validity and reliability in a number of samples, but we used only three items from the scale, and the covariate variable emotional support was assessed here with a two-item index that was not validated.

Possible confounds not measured in this study could conceivably account for observed associations between religiosity or spirituality and depression. Although we controlled for social support and other sociodemographic variables possibly associated with religiosity and spirituality, other potential confounds remain. Religiosity and spirituality are at least weakly associated with health behaviors, such as diet, exercise, and physical activity (Koenig et al., 2012), all of which could have an impact on mothers' mental health. Religious attendance is associated with better physical health, which could be responsible for associations with depressive symptoms, although this association is more likely to be present and relevant in samples of older individuals (Oman & Thoresen, 2002). Finally, both religiosity and spirituality are associated with positive emotions and behaviors, such as optimism, self-esteem, and forgiveness, that may be linked to mental health and should be further explored as explanatory mechanisms of the associations of religiosity and spirituality and health (Oman & Thoresen, 2002).

In the future, longitudinal research is much needed to elucidate the directionality of the links between religiosity, spirituality, and depression from pregnancy or pre-pregnancy through postpartum. These research designs would enable us to test hypotheses about timing of the protective effects of these resources and to identify women at risk and means of intervening to assist them. Measurement of additional domains of religiosity and spirituality is necessary to identify specific aspects that are and are not protective and relevant. Furthermore, it

would be useful to extend this research to other mental-health issues known to be important in pregnancy, such as anxiety (Horowitz & Goodman, 2005). Last, it would be important to test further mediators of protective effects, including additional psychological variables, such as relaxation, coping mechanism, and optimism, as well as physiological processes, such as inflammation. All of these advances would help us to determine whether and how interventions that incorporate religiosity and spirituality may be helpful for women suffering poor mental health during the pregnancy period.

Author Contributions

This article is designated a Core Paper of the CCHN, given that it reflects major ideas and work considered central to the network. Accordingly, the last designated author is the network itself, preceded by the names of those on the writing team who directly prepared this article listed in the order the team judged best reflects their relative contributions.

A. C. D. Cheadle conceived the research questions, conducted analyses and drafted the article. C. Dunkel Schetter assisted in developing study design and writing, and is a CoPrincipal Investigator of the network that conducted the study. R. Gaines Lanzi, M. Reed Vance, L. S. Sahado, and M. U. Shalowitz contributed to the network study planning and data collection and critically reviewed the article for important intellectual content.

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The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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