

Fatigue as a Predictor of Postpartum Depression

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Background: The postpartum is a time when women commonly report increased fatigue that may contribute to depression. Studies have not examined fatigue alone as a predictor of postpartum depression.

Objective: To examine whether and when fatigue in the early postpartum is predictive of postpartum depression.

Design: Correlational, longitudinal study.

Setting: Two hospitals and participants' homes in central Pennsylvania.

Participants: Convenience sample of 38 healthy women recruited from hospital maternity units within 24 hours after an uncomplicated birth.

Main Outcome Measures: Fatigue was measured using the Modified Fatigue Symptom Checklist (MFSC) on Days 0, 7, 14, and 28 after childbirth. Depression was assessed using the Center for Epidemiological Studies-Depressive Symptomatology Scale (CES-D) on Day 28.

Results: After adjustments for multiple comparisons, a significant correlation was obtained between fatigue as measured by the MFSC and postpartum depression on Day 7 ($r = .46$; $p < .05$), Day 14 ($r = .57$), and Day 28 ($r = .70$). Fatigue on Day 0 was correlated with fatigue on Day 7 ($r = .45$), Day 14 ($r = .58$), and Day 28 ($r = .34$).

Conclusions: Fatigue as early as 7 days postpartum is predictive of depression at Day 28 postpartum. *JOGNN*, 31, 436-443; 2002.

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The birth of a child is generally thought of as a time of great joy for everyone involved. Although

this is true for many women, for others the postpartum is not joyful, but instead, physical and emotional stresses make this time one of anxiety or even depression (Nicolson, 1999). It is culturally discouraged, however, to voice negative feelings during this period of time, regardless of the dramatic developmental changes occurring (Small, Brown, Lumley, & Astbury, 1994). Instead, women giving birth are expected to adapt without difficulty to changes in lifestyle and relationships, new dependent care demands, and multiple new roles (Fowles, 1998). For many women, this is impossible. Instead, the demands of early infant care frequently result in symptoms of fatigue (Gardner, 1991; Milligan, Lenz, Parks, Pugh, & Kitzman, 1996) and mild to severe depression (Campbell & Cohn, 1991; Cox, Murray, & Chapman, 1993; Small et al., 1994; Wood, Thomas, Droppleman, & Meighan, 1997). The purpose of the current study was to examine the predictive ability of postpartum fatigue on the development of postpartum depression.

Theoretical Framework

The current study is based on Mercer's theoretical framework of Maternal Role Attainment (Bee, Legge, & Oetting, 1994). This theory examines the interrelated and complex factors of the antepartum and postpartum periods in a new mother's life and their effect on attainment of the maternal role. Mercer's model uses Bronfenbrenner's ecological theory of expanding circles of the microsystem, exosystem, and macrosystem that encompass the mother, child, and family (see Figure 1). Factors in all these systems affect the mother and the quality of her maternal role attainment to varying degrees. One factor criti-

cal in the microsystem, or the most immediate environment, is the presence or absence of depression (Fowles, 1998). According to Mercer's theory, maternal depression is a factor that can hamper the attainment of the maternal role. Nursing care to help prevent, moderate, or overcome postpartum depression would therefore positively affect the well-being of the mother, infant, and the entire family.

Literature Review

As a result of the physical and emotional demands of childbirth, the postpartum transition period is a time when women may be at higher risk of developing dysphoric mood states. The mildest of these, postpartum blues, is generally accepted as an early and transient condition apparent during the first 2 weeks after childbirth, with an incidence of 50% to 80% (Hamilton, 1989; Hopkins, Marcus, & Campbell, 1984; Sutter, Leroy, Dally, Verdoux, & Bourgeois, 1997). Although not considered a precursor to postpartum depression, severe cases of postpartum blues may be a first sign of postpartum depression for some individuals (Hapgood, Elkind, & Wright, 1988; Sutter et al., 1997). A second dysphoric mood state, postpartum psychosis, is a rare and very serious problem occurring generally within 2 to 3 weeks of delivery at a rate of 1 to 2 per 1,000 newly delivered women (Hopkins et al., 1984; Najman, Andersen, Bor, O'Callaghan, & Williams, 2000). The third category of dysphoric mood state, postpartum depression, stands in the literature as a more common but also more controversial occurrence.

The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (1994) does not recognize postpartum depression as a diagnosis in its own right, but instead identifies a "postpartum onset specifier" to major depression if the onset is within 4 weeks of childbirth. The concept of postpartum depression is, however, commonly accepted in the medical and nursing community and in the general literature, even when its onset is beyond this limited timeframe (Steiner, 1998; Wood et al., 1997). Research suggests that the development of postpartum depression is typically slow and insidious, and may not occur until up to 3 months postpartum (Small et al., 1994). Similar time periods have been described in Beck's (1996) and Wood et al.'s reviews. Often women and their families do not recognize the onset of postpartum depression.

Reported rates of postpartum depression are varied and are likely influenced by measurement criteria, the accuracy of recall as an assessment tool, the culture of the population, and sample size (Affonso, Lovette, Paul, & Sheptak, 1990; Cox et al., 1993; Green, 1998; Najman et al., 2000). Recent work by Beck and Gable (2001) estimates a 12% prevalence of major and 19% minor postpartum depression, agreeing with earlier literature reviews, which concluded that as many as 20% of postpartum

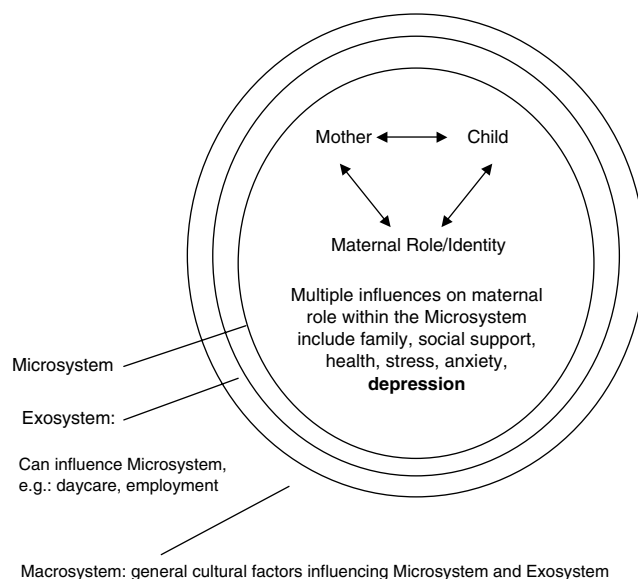


FIGURE 1
Representation of Mercer's Maternal Role Attainment Model.

Note. From "Maternal Role: Models and Consequences" by Ramona T. Mercer, a paper presented at the International Nursing Research Conference sponsored by the Council of Nurse Researchers and the American Nurses Association in Los Angeles, CA, in 1991. Reprinted with permission.

women experience mild to moderate depression (Hopkins et al., 1984; Whiffen, 1992).

Symptoms of generalized depression (American Psychiatric Association, 1994) include loss of energy or fatigue, depressed mood, loss of interest or pleasure in most activities, a significant change in appetite or weight, insomnia or hypersomnia, psychomotor changes, feelings of worthlessness or guilt, lowered concentration or indecisiveness, and recurrent thoughts of suicide or death. Few studies describe unique symptoms associated with postpartum depression, except for suggestions that it is of a more anxious, irritable, and angry character than other types of depression (Affonso et al., 1990; Beck, 1995; Beck & Gable, 2000).

Fatigue, a common symptom of all types of depression, is extremely prevalent in postpartum women (Pugh & Milligan, 1995). In 1999, Aaronson et al. defined fatigue as "the awareness of a decreased capacity for physical and/or mental activity due to an imbalance in the availability, utilization, and/or restoration of resources needed to perform activity" (p. 46). Postpartum fatigue in particular is often viewed as a normal consequence of the physical adaptations and demands of motherhood. Rates of fatigue climb from 20% preconceptionally to 50% to 64% among women immediately postpartum (Lee & Zaffke, 1999; Whiffen, 1992). Women themselves rate exhaustion among the top four contributing factors to postpartum depression (Small et al., 1994).

Fatigue has been recorded in an overwhelming majority of women experiencing postpartum depression (Caltabiano & Caltabiano, 1996; Whiffen, 1992). Fatigue has been significantly correlated with, but not predictive of, depression using the Beck Depression Inventory at 2 days and 2 weeks postpartum, but not at 6 weeks, by which time fatigue had generally improved (Gardner, 1991). Waldenstroem (1988) noted a weak pos-

In this sample, measures of early postpartum fatigue on Days 7 and 14 are predictive of later postpartum depression.

itive association between fatigue and tearfulness during the first 2 weeks postpartum and depressed mood peaking in the 2nd and 3rd weeks postpartum. The variables, however, were measured related to time of hospital discharge, not severity, and depression was measured by recall at 6 weeks. Campbell and Cohn (1991) in their study of postpartum depression found a rate of prevalence of depression no higher than that of the general population, yet almost 40% of their study population had one to two somatic symptoms of depression. The symptoms primarily reported were fatigue and decreased appetite, both of which were attributed to the normal physiologic changes associated with childbirth and adaptation to parenthood. Troy's 1999 study saw a significant relationship between depression and early morning fatigue even at 14 to 19 months postpartum.

Literature supports the distinction between postpartum fatigue, a multidimensional concept composed of psychologic and physical components, and postpartum depression, even though fatigue is a diagnostic criterion of depression (Campbell, 1986; Gardner, 1991; Pugh, 1993). Milligan et al. (1996) noted that symptoms of fatigue and depression had distinct and separate patterns of change during the postpartum and that women were able to differentiate between them.

Numerous inventories exist to assess postpartum depression (Affonso et al., 1990; Beck & Gable, 2000, 2001; Hopkins et al., 1984; Radloff, 1977). There are, however, few established predictive tools to accurately identify women at risk for developing postpartum depression, and none of them specifically address fatigue (Beck, 1996, 1998).

Research Question

The current study examined early postpartum fatigue as a predictor of depression in women during the postpartum. Levels of early postpartum fatigue were meas-

ured using the Modified Fatigue Symptom Checklist (MFSC) in 38 women at Days 0 (within 24 hours after delivery), 7, 21, and 28 after childbirth. Depression was measured by the Center for Epidemiological Studies-Depressive Symptomatology Scale (CES-D) at Day 28 postpartum. Data were collected to explore the questions (a) Is postpartum fatigue predictive of postpartum depression? and (b) If fatigue is predictive of postpartum depression, which time point is the earliest reliable predictor of mothers at risk of postpartum depression?

Methods

A correlational, longitudinal study was employed. Thirty-eight women were recruited from two hospitals in central Pennsylvania within 24 hours of giving birth. Inclusion criteria included the following: vaginal birth without postpartum hemorrhage, full-term newborn without complications, neither mother nor newborn demonstrating any acute or chronic illness, and neither mother nor newborn taking any medications other than maternal usage of postnatal vitamins.

Instruments

Fatigue. The MFSC consists of 30 statements measuring psychologic and physical symptoms of fatigue (Yoshitake, 1978). Participants are asked to answer statements describing their experiences since the delivery or during the past week with either a yes or a no response, and can score a maximum of 30 points. The investigators read statements such as "my brain feels hot and muddled" and "I can't straighten my posture." This checklist was modified (Pugh, Milligan, Parks, Lenz, & Kitzman, 1999) to provide clearer directions, and the instrument was tested on a large longitudinal sample of postpartum women ($N = 285$). In Pugh et al.'s (1999) study, the internal consistency reliability (Kuder-Richardson formula) was .82 to .85. The concurrent validity of this measure was demonstrated by significant correlations with a single tiredness visual analog scale and the MFSC ($r = .64; p < .01$). Construct validity has been supported by significant correlations ($p < .05$) in the appropriate direction with other psychometrically sound instruments measuring related constructs, the CES-D (Radloff, 1977), and the Spielberger State-Trait Anxiety Inventory (Spielberger, 1983). This is consistent with the conceptual issue of the distinction between fatigue and depression during the postpartum period as reported by Milligan et al. (1996).

Postpartum Depression. The CES-D (Radloff, 1977) was used to assess for depression. This 20-item self-report scale has been used in past studies of depression in postpartum women (Campbell & Cohn, 1991; Carter, Baker, & Brownell, 2000; Greene, Nugent, Wiczorek-Deering, O'Mahony, & Graham, 1991; Pascoe & French, 1990;

Troy, 1999; Wilcox, Field, Prodromidis, & Scafidi, 1998). It has been shown to be a reliable measure of symptoms of depression and a valid screening tool for further evaluation (Radloff, 1977). In addition, the instrument has fewer items measuring the confounding somatic symptoms associated with childbirth (Campbell & Cohn, 1991). Wilcox et al. reported adolescent mothers had a preference for the simpler and shorter CES-D over other tools. Statements such as "I felt that everything I did was an effort" and "people were unfriendly" were read to the participants. They were asked to consider how often they felt this during the previous week and respond to these statements on a 4-point scale of 0 (rarely or none of the time) to 3 (most or all of the time). Responses to questions 4, 8, 12, and 16 were inverted for scoring purposes. Of the possible 0 to 60 points that can be scored on the CES-D, a cutoff point of 16 is used to identify severe depression and 11 to identify mild depression (Radloff, 1977).

Procedure

Hospital staff members distributed letters to mothers who had just given birth, inviting them to volunteer to participate in a study on the occurrence of postpartum fatigue. The mothers who indicated an interest in joining the study returned the completed invitation form to the staff, who then notified the investigators of potential participants. The mothers signed an informed consent form during their first visit with one of the investigators (Day 0) while still in the hospital. They were assured of strict

Fatigue screening within the first 2 weeks postpartum may identify women who are at risk of later postpartum depression and thus greatly improve early treatment outcome.

confidentiality and the right to discontinue their participation at any time. Demographic information was then gathered, including age, marital status, ethnicity, work status, other children at home, intent to breast- or bottle-feed, and use of prenatal vitamins. During the hospital visit (Day 0), participants also were asked to complete the fatigue questionnaire. At the end of the hospital interview, arrangements were made for follow-up visits in the participants' homes.

All participants were visited in their homes on Days 7, 14, and 28 after giving birth. The final testing time of 28 days was chosen to fit into the *DSM-IV* (1994) diagnosis of postpartum depression onset and to capture the time period of peak postpartum fatigue (Troy, 1999). The

fatigue questionnaires were administered again, and continuing information on feeding method, prenatal vitamin usage, and work status was collected. Finger prick hemoglobin levels were measured, using a portable hemoglobin analyzer (Hemaque, Mission Viejo, CA). At the final visit, all except 1 woman completed the CES-D questionnaire to assess for depression ($n = 37$).

The questionnaires were read to participants at every session. Home visits generally lasted less than 30 minutes.

Results

Sample Data

Of the 38 participants, 82% were married, 87% were White, 8% were Asian American, and 5% were of East Indian ethnicity. More than half of the women (60%) had other children at home. Maternal ages ranged from 19 to 37 years, with a mean age of 28.3 years ($SD = 4.7$). Of the 38 women, 82% were breastfeeding their newborns in the hospital, and all but 3 had taken prenatal vitamins throughout their pregnancy. By Day 28, 66% of the women were still breastfeeding at least 50% of the time. None of the women was working outside the home during the time of this study.

Data Analysis

Demographic data were plotted and statistical analysis utilized to answer the research questions posed in this study: (a) Is postpartum fatigue predictive of postpartum depression? and (b) If fatigue is predictive of postpartum depression, which time point is the earliest reliable predictor of mothers at risk of postpartum depression? Responses to fatigue measures were determined at each time point, and repeated measures analysis was used to identify time-related differences in this variable. Correlations between self-reports of fatigue and the depressive symptoms index at Day 28 were evaluated at each time point using Pearson's product-moment correlations. Logistic regression was used to predict the odds of scoring above 11 on the CES-D, indicating depression, from the fatigue scores on Days 0, 7, 14, and 28. Descriptive statistics were used to estimate cutoff MFSC scores for women at risk of severe depression (16 or higher on the CES-D). The alpha level for all data analysis was $p < .05$. For all calculations, SPSS (2002) software was used.

Fatigue and Depression

Correlational analysis was used to determine that, at each time point except Day 0, the self-report of fatigue was highly correlated with self-report of depressive symptoms at Day 28 (see Table 1). The calculated percentage of variance for postpartum depression was notable and increasing. On Day 7, fatigue accounted for 21% of the

TABLE 1

Pearson Correlation, Level of Significance, and Percentage of Variance Between Self-Reports of Fatigue at Each Time Point Using the MFSC^a and Depression Index at Day 28

Variable	Fatigue Day 7	Fatigue Day 14	Fatigue Day 28	Depression Day 28	Percentage of Variance at Day 28
Fatigue Day 0	.458 (.004)*	.588 (.0001)*	.348 (.032)	.281 (.092)	
Fatigue Day 7		.573 (.0001)*	.495 (.002)*	.463 (.004)*	21%
Fatigue Day 14			.725 (.0001)*	.575 (.0001)*	33%
Fatigue Day 28				.708 (.0001)*	50%

Fatigue, $n = 38$; depression, $n = 37$. Adjusted for multiple comparison $p < .01$.

^aModified Fatigue Symptom Checklist.

*Correlation is significant.

variance in depressive symptoms at Day 28. This increased to 33% by Day 14 and 50% by Day 28. In this sample, fatigue was predictive of postpartum depression.

The fatigue scores for each woman at each time point were correlated significantly with fatigue scores at each other time point. Repeated measures analyses of variance were used, and a significant difference in fatigue scores with time was observed, $F(3, 111) = 14.61, p = .001$, with fatigue peaking on Day 0, then falling over the next 4 weeks. There were no significant differences in fatigue scores based on marital status, presence of other children at home, ethnicity, breastfeeding or bottle-feeding, the use of prenatal vitamins, or hemoglobin concentration (data not shown). Logistic regression analysis of fatigue and depression scores predicted increased odds at all time points of scoring above 11 on the CES-D at Day 28 based on fatigue scores from Day 0 to Day 28. Specifically, odds increased from 1.17 (Day 0), 1.25 (Day 7), 1.83 (Day 14), to 7.15 (Day 28). All odds are significant ($p < .03$). This suggests that women who reported the greatest level of fatigue in the hospital continued to report high levels of fatigue at each home visit and were the most likely to report the greatest number of depressive symptoms on the CES-D administered at Day 28.

Ancillary Analysis. One woman declined to complete the depression survey. The mean depression score measured on Day 28 for all other participants ($n = 37$) was 8.95 ($SD = 7.56$), with a range of 0 to 28. The average fatigue scores for all women dropped from Day 0 through Day 28 (from $M = 9.76, SD = 5.68$, to $M = 4.57, SD = 4.41$). Based on results of the MFSC, 23 of the 37 women were considered nondepressed, scoring less than 11 on the CES-D. These women demonstrated an even and pronounced decline in their fatigue rates, measuring 8.04 ($SD = 4.65$) on Day 0, 5.17 ($SD = 3.71$) on Day 7, 3.57 ($SD = 2.90$) on Day 14, and 1.83 ($SD = 1.53$) on Day 28. A total of 14 women (36.8%) scored as depressed, with CES-D

scores of 11 or above ($M = 17.07, SD = 5.92$). Six women (15.8%) scored as severely depressed ($M = 23, SD = 3.85$), with CES-D scores of 16 or higher (Radloff, 1977).

The smooth decline in fatigue scores in the nondepressed women was especially apparent when compared with the higher and fluctuating fatigue levels of women identified as depressed by the CES-D. The mean fatigue scores in the severely depressed group (CES-D ≥ 16) were 10.50 on Day 0 ($SD = 5.13$), 11.17 on Day 7 ($SD = 7.08$), 8.50 on Day 14 ($SD = 3.02$), and 9.67 on Day 28 ($SD = 4.27$). Of the eight women who were identified as mildly depressed (CES-D between 11 and 15, $M = 12.63, SD = 1.30$), mean fatigue scores were 14.3 on Day 0 ($SD = 6.88$), 8.63 on Day 7 ($SD = 4.81$), 11.25 on Day 14 ($SD = 4.89$), and 8.62 on Day 28 ($SD = 3.70$). The changes in fatigue over time are shown in Figure 2 for women scoring less than 11, between 11 and 15, and more than 16 on the CES-D. All but one woman who scored as depressed on the CES-D reported fatigue scores nearly one standard deviation above the mean of nondepressed women on Day 14. This suggests that most women scoring 6 or above on the MFSC on Day 14 may be at an increased risk of postpartum depression.

Discussion

Results of this study support the hypothesis that early postpartum fatigue is predictive of postpartum depression, lending support to the first research question, Is postpartum fatigue predictive of postpartum depression? Increasingly significant correlations between symptoms of fatigue at Days 7, 14, and 28 postpartum and symptoms of depression at Day 28 suggest fatigue screening could be used to identify those women most at risk of developing postpartum depression. Although rates of depression over 50% have been found among pregnant women (Pugh & Milligan, 1995), the literature is unclear about whether it

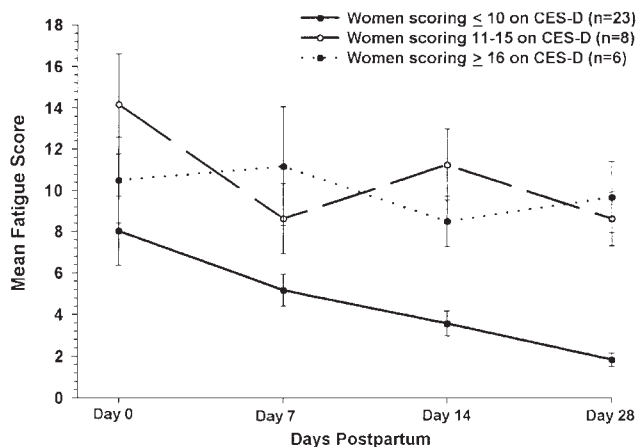


FIGURE 2
Change in self-report of fatigue over time (means ± SEM).

^aCES-D = Center for Epidemiological Studies-Depressive Symptomatology Scale.

^bSEM = Standard error of measurement.

is possible to accurately predict postpartum depression from late antenatal depression (Greene et al., 1991; Whiffen, 1992). Therefore, postpartum screening of women with and without symptoms of depression during pregnancy is important. The rising percentage of variance of 21%, 33%, and 50% between Days 7, 14, and 28 further supports the relationship between fatigue and postpartum depression.

Answering the second research question, If fatigue is predictive of postpartum depression, which time point is the earliest reliable predictor of mothers at risk of postpartum depression? is more difficult. The correlation between fatigue at Day 0 and symptoms of depression at Day 28 was not statistically significant, although fatigue reports were significantly correlated with each other. No correlations were noted between breastfeeding and other demographic factors. Odds of scoring mildly to severely depressed on Day 28, computed by logistic regression, were positive and increased from Days 0 to 28. The correlations between symptoms of fatigue and postpartum depression and positive logistic regression odds suggest that fatigue measures, at least by Day 7 and certainly by Day 14, may be useful in screening for postpartum depression at Day 28. From this sample population, it also appears that a cutoff score on the MFSC of 6 or greater on Day 14 would warrant further evaluation. Table 2 depicts the specificity and sensitivity of adapting a self-report of 6 or greater on the MFSC as an indicator of risk for depression in this small sample.

The results of this study add to the existing literature on the relationship between fatigue and postpartum depression. Fatigue is widespread among women during the postpartum (Lee & Zaffke, 1999), and early measurement of

depression is clouded by the overlapping symptoms of fatigue attributed to childbearing. Although fatigue is a diagnostic criterion of depression (American Psychiatric Association, 1994), postpartum fatigue is reported as distinguishable from postpartum depression (Campbell, 1986; Gardner, 1991; Milligan et al., 1996; Pugh, 1993).

Many women who are experiencing postpartum depression do not realize it or do not discuss it with health care providers or family (Small et al., 1994). By the time women return for their 6-week postpartum appointment with their obstetrician or midwife, depression may be well established and may be overlooked. The duration of a depressive episode is longer and more resistant to treatment the later it is diagnosed (Nonacs & Cohen, 1998). The important detrimental considerations of maternal postpartum depression include the health effects on the child: increased thoughts of harming the infant among depressed mothers (Jennings, Ross, Popper, & Elmore, 1999); reduced mother-infant interaction and its later developmental implications for the child (Beck, 1995; Murray, Fiori-Cowley, Hooper, & Cooper, 1996); the high risk of recurrence of depression, estimated at 30% to 50% (Najman et al., 2000; Spinelli, 1998); and the effect on other family members, notably fathers (Boath, Pryce, & Cox, 1998; Meighan, Davis, & Thomas, 1999). Thus, it is most important to identify women at risk of developing depression as soon as possible after childbirth.

From this sample population, it appears that a self-report on the MFSC of 6 or greater on Day 14 warrants further evaluation.

Limitations

The limitations of this study include its relatively small and homogenous sample of White, mostly married, women. In addition, self-selection of participants occurred, because all were volunteers. Also, there were no prenatal measures of fatigue. Depression measures during pregnancy and at Days 0, 7, and 14 would be useful to help identify existing or changing patterns of puerperal depression. In addition, using a depression screening tool developed specifically for postpartum women (Beck & Gable, 2000, 2001), as opposed to the more general CES-D, may better identify postpartum depression. Data about predisposing personal or family histories of mood disorders may clarify the usefulness of the results. A longer time interval for final follow-up could have altered the final total number of women with symptoms of postpartum depression.

TABLE 2

Sensitivity and Specificity of Using Fatigue Score on Day 14 Postpartum to Predict Depression on Day 28

<i>Prediction</i>	<i>Actual Health Condition of Client</i>	
	<i>Depression Exists</i>	<i>No Depression Exists</i>
Depression predicted to exist on Day 28 based on fatigue score on Day 14 of ≥ 6	True Positive 13/14	False Positive 6/23
Depression predicted to be absent on Day 28 based on fatigue score on Day 14 of < 6	False Negative 1/14	True Negative 17/23

Implications for Nursing

Enabling a woman to attain her maximum potential maternal role should be an important focus in nursing. Postpartum depression may hinder a new mother in developing this role (Bee et al., 1994; Fowles, 1998). Using a simple fatigue screening within the first 2 weeks postpartum may identify women who are at risk of later postpartum depression and may greatly improve treatment outcome (Straub et al., 1998). Better still, early informational support, education, and interventions to reduce fatigue (Troy & Dalgas-Pelish, 1995) might prevent depression in the first place. The MFSC is a straightforward, rapid screening instrument. Nursing is in a good position to use such a predictive tool in the very early postpartum period. Ideally, fatigue could be assessed even before discharge from a hospital or birthing center. More likely, screening should be possible at 1 to 2 weeks postpartum, earlier than traditional follow-up visits. In fact, given the effect of maternal depression on the health of the newborn and other children at home, it may be possible under some circumstances for this simple screening measure to take place in the pediatric office at the 2-week newborn visit, instead of waiting for a later postpartum visit. Even a telephone follow-up call to a new mother might allow for assessment of severe fatigue.

The primary finding in this study was that fatigue is predictive of postpartum depression. Further research is recommended, using a larger, more diverse sample of women. The eventual effect of targeted interventions to prevent or moderate fatigue on the incidence of postpartum depression will be an important outcome of this research.

REFERENCES

Aaronson, L. S., Teel, C. S., Cassmeyer, V., Neuberger, G., Pallikathayil, L., Pierce, J., Press, A. N., Williams, P. D., & Wingate A. (1999). Defining and measuring fatigue. *Image: Journal of Nursing Scholarship*, 31, 45-50.

Affonso, D. D., Lovette, S., Paul, S. M., & Sheptak, S. (1990). A standardized interview that differentiates pregnancy and postpartum symptoms from perinatal clinical depression. *Birth*, 18(3), 121-130.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Beck, C. T. (1995). The effects of postpartum depression on maternal infant interaction: A meta-analysis. *Nursing Research*, 44(5), 298-304.

Beck, C. T. (1996). A meta-analysis of predictors of postpartum depression. *Nursing Research*, 45(5), 297-303.

Beck, C. T. (1998). The effects of postpartum depression on child development: A meta-analysis. *Archives Psychiatric Nursing*, 12(1), 12-20.

Beck, C. T., & Gable, R. K. (2000). Postpartum depression screening scale: Development and psychometric testing. *Nursing Research*, 49(5), 272-282.

Beck, C. T., & Gable, R. K. (2001). Further validation of the postpartum depression screening scale. *Nursing Research*, 50(2), 201-209.

Bee, A. M., Legge, D., & Oetting, S. (1994). Ramona T. Mercer. In A. Marriner-Tomey (Ed.), *Nursing theorists and their work* (pp. 390-399). St Louis, MO: Mosby-Year Book.

Boath, E. H., Pryce, A. J., & Cox, J. L. (1998). Postnatal depression: The impact on the family. *Journal of Reproductive & Infant Psychology*, 16(2-3), 199-203.

Caltabiano, N. J., & Caltabiano, M. L. (1996). Relationship between exhaustion and postnatal depression. *Psychological Reports*, 79(1), 225-226.

Campbell, S. B. (1986). Postpartum sleep patterns of mother-baby pairs. *Midwifery*, 2, 193-201.

Campbell, S. B., & Cohn, J. F. (1991). Prevalence and correlates of postpartum depression in first-time mothers. *Journal of Abnormal Psychology*, 100(4), 594-599.

Carter, A. S., Baker, C. W., & Brownell, K. D. (2000). Body mass index, eating attitudes, and symptoms of depression and anxiety in pregnancy and the postpartum period. *Psychosomatic Medicine*, 62(2), 264-270.

Cox, J. L., Murray, D., & Chapman, G. (1993). A controlled study of the onset, duration and prevalence of postnatal depression. *British Journal of Psychiatry*, 163, 27-31.

Fowles, E. R. (1998). The relationship between maternal role attainment and postpartum depression. *Health Care for Women International*, 19(1), 83-94.

Gardner, D. L. (1991). Fatigue in postpartum women. *Applied Nursing Research*, 4(2), 57-82.

Green, J. M. (1998). Postnatal depression or perinatal dysphoria? Findings from a longitudinal community-based study using the Edinburgh Postnatal Depression Scale. *Journal of Reproductive & Infant Psychology*, 16(2-3), 143-155.

- Greene, S. M., Nugent, J. K., Wiczorek-Deering, D. E., O'Mahony, P., & Graham, R. (1991). The patterning of depressive symptoms in a sample of first-time mothers. *Irish Journal of Psychology, 12*(2), 263-275.
- Hamilton, J. A. (1989). Postpartum psychiatric syndromes. *Psychiatric Clinics of North America, 12*(1), 89-103.
- Hapgood, C. C., Elkind, G. S., & Wright, J. J. (1988). Maternity blues: Phenomena and relationship to later postpartum depression. *Australian & New Zealand Journal of Psychiatry, 22*(3), 299-306.
- Hopkins, J., Marcus, M., & Campbell, S. B. (1984). Postpartum depression: A critical review. *Psychological Bulletin, 95*(3), 498-515.
- Jennings, K. D., Ross, S., Popper, S., & Elmore, M. (1999). Thoughts of harming infants in depressed and nondepressed mothers. *Journal of Affective Disorders, 54*(1-2), 21-28.
- Lee, K. A., & Zaffke, M. E. (1999). Longitudinal changes in fatigue and energy during pregnancy and the postpartum period. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 28*(2), 183-191.
- Meighan, M., Davis, M., & Thomas, S. P. (1999). Living with postpartum depression: The father's experience. *MCN, American Journal of Maternal/Child Nursing, 24*(4), 202-208.
- Milligan, R., Lenz, E. R., Parks, P. L., Pugh, L. C., & Kitzman, H. (1996). Postpartum fatigue: Clarifying a concept. *Scholarly Inquiry for Nursing Practice, 10*(3), 279-291.
- Murray, L., Fiori-Cowley, A., Hooper, R., & Cooper, P. (1996). The impact of postnatal depression and associated adversity on early mother-infant interactions and later infant outcomes. *Child Development, 67*(5), 2512-2526.
- Najman, J. M., Andersen, M. J., Bor, W., O'Callaghan, M. J., & Williams, G. M. (2000). Postnatal depression—myth and reality: Maternal depression before and after the birth of a child. *Social Psychiatry & Psychiatric Epidemiology, 35*(1), 19-27.
- Nicolson, P. (1999). Loss, happiness and postpartum depression: The ultimate paradox. *Canadian Psychology, 40*(2), 162-178.
- Nonacs, R., & Cohen, L. S. (1998). Postpartum mood disorders: Diagnosis and treatment guidelines. *Journal of Clinical Psychiatry, 59*(Suppl. 2), 34-40.
- Pascoe, J. M., & French, J. (1990). The reliability and validity of the maternal social support index for primiparous mothers: A brief report. *Family Medicine, 22*(3), 228-230.
- Pugh, L. C. (1993). Childbirth and the measurement of fatigue. *Journal of Nursing Measurement, 1*(1), 57-66.
- Pugh, L. C., & Milligan R. A. (1995). Patterns of fatigue during childbearing. *Applied Nursing Research, 8*, 140-143.
- Pugh, L. C., Milligan R., Parks P., Lenz E., & Kitzman H. (1999). Clinical approaches to the assessment of maternal fatigue. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 28*, 74-80.
- Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385-401.
- Small, R., Brown, S., Lumley, J., & Astbury, J. (1994). Missing voices: What women say and do about depression after childbirth. *Journal of Reproductive & Infant Psychology, 12*(2), 89-103.
- Spielberger C. D. (1983). *State-Trait Anxiety Inventory: A comprehensive bibliography*. Palo Alto, CA: Consulting Psychologists Press.
- Spinelli, M. G. (1998). Antepartum and postpartum depression. *The Journal of Gender-Specific Medicine, 1*(2), 33-36.
- SPSS. (2002). *SPSS Incorporated*. Version 10.1. Chicago: Author.
- Steiner, M. (1998). Perinatal mood disorders: Position paper. *Psychopharmacology Bulletin, 34*(3), 301-306.
- Straub, H., Cross, J., Curtis, S., Iverson, S., Jacobsmeyer, M., Anderson, C., & Sorenson, M. (1998). Proactive nursing: The evolution of a task force to help women with postpartum depression. *MCN, The American Journal of Maternal Child Nursing, 23*(5), 262-265.
- Sutter, A. L., Leroy, V., Dallay, D., Verdoux, H., & Bourgeois, M. (1997). Postpartum blues and mild depressive symptomatology at days three and five after delivery: A French cross-sectional study. *Journal of Affective Disorders, 44*(1), 1-4.
- Troy, N. W. (1999). A comparison of fatigue and energy levels at 6 weeks and 14 to 19 months postpartum. *Clinical Nursing Research, 8*(2), 135-152.
- Troy, N. W., & Dalgas-Pelish, P. (1995). The development of a self-care guide for postpartum fatigue. *Applied Nursing Research, 8*, 92-96.
- Waldenstroem, U. (1988). Early and late discharge after hospital birth: Fatigue and emotional reactions in the postpartum period. *Journal of Psychosomatic Obstetrics & Gynecology, 8*(2), 127-135.
- Whiffen, V. E. (1992). Is postpartum depression a distinct diagnosis? *Clinical Psychology Review, 12*(5), 485-508.
- Wilcox, H., Field, T., Prodromidis, M., & Scafidi, F. (1998). Correlations between the BDI and CES-D in a sample of adolescent mothers. *Adolescence, 33*(131), 565-574.
- Wood, A. F., Thomas, S. P., Droppleman, P. G., & Meighan, M. (1997). The downward spiral of postpartum depression. *MCN, The American Journal of Maternal Child Nursing, 22*(6), 308-317.
- Yoshitake, H. (1978). Three characteristic patterns of subjective fatigue symptoms. *Ergonomics, 21*, 231-233.

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