The Relationship of Women's Postpartum Mental Health to Employment, Childbirth, and Social Support

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Background. This study was conducted to examine changes in women's mental health over the first postpartum year and factors that are associated with mental health.

Methods. Participants included women who were married, employed, English-speaking, and giving birth to their first child at one of two hospitals in St Paul, Minnesota. Women who were eligible and willing to participate were mailed questionnaires at 1, 3, 6, 9, and 12 months postpartum.

Results. There were significant changes in mothers' general mental health, depression, and anxiety over the first postpartum year ($P \leq .01$), with least favorable outcomes at 1 month and most favorable outcomes at 12 months postpartum. Poor mental health was related to work factors, such as longer work hours and maternity leave of less than 24 weeks, and to variables often associated with recent childbirth, such as maternal fatigue, loss of sleep, concerns about appearance, and infant illnesses. In addition, postpartum symptoms were predicted by physical illness, previous mental problems, poor general health, poor social support, fewer recreational activities, young age, and low income (R^2 = 37% to 57%).

Conclusions. In this select group of women, postpartum mental health was found to be least favorable 1 month after delivery and related to factors associated with employment, recent delivery, and level of social support.

Key words. Postpartum; mental health, parental leave, social support. (*J Fam Pract 1994; 38:465-472*)

For many women, the birth of a baby is associated with mental health problems, including the "blues," which is seen in 50% to 80%[1,2]; psychosis, which occurs in 0.1% to 0.4%[3]; and postpartum depression, which is seen in 16.5% to 24% of women during the first postpartum year.[4–7] Depression rates range from 8.3% to 20% at 6 to 8 weeks postpartum,[5,8,9] 14% at 3 months,[4,10] and 11.6% at 6 months.[4]

Some investigators believe that the rate of psychiatric disorders is no greater in postpartum women than in women in the general population.[11] However, a comparison between the point frequencies of postpartum mental disorders and the 3.9% 1-month prevalence rate of major depressive episodes reported by the National Institute of Mental Health for women between 25 and 44 years of age[12] suggests higher rates for mental disorders among postpartum women. Kendell's finding that psychiatric consultations dramatically increase in the first trimester after childbirth as compared with the 2-year period before childbirth[13] provides further evidence of a higher rate of psychiatric problems in the postpartum period.

There is also controversy about the onset, course, and duration of postpartum mental disorders. For example, postpartum depression has traditionally been thought to begin within the first 6 weeks after delivery.[14] Some investigators still maintain that most new cases of postpartum depression occur within the first weeks or months after delivery.[1,4] However, others claim that most new cases begin after the third postpartum month.[15]

Opinions about the duration of postpartum disor-

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ders also differ greatly. Cooper and associates[11] found that of 55 cases of nonpsychotic psychiatric postpartum disorders, two thirds lasted 3 months or less. On the other hand, Pitt[8] found that 12 of 33 women with postpartum depression (36%) had not improved after 1 year, and two other investigations showed that approximately one half of postpartum depressed patients experienced repeated or prolonged periods of impaired mental health during the next few years.[4,16]

Recognizing the potential impact of postpartum depression on the new mother, several investigators have attempted to identify variables that are related to and possibly contribute to or prevent this disorder. Factors that have been associated with postpartum depression in the literature can be grouped under maternal variables, infant characteristics, and partner, family, and other social factors. Maternal characteristics that have been linked to postpartum mental distress include being single,[17,18] being younger,[9] being an anxious person,[18] having a prior history of depression,[9,18,19] having a first baby,[17] having an unwanted baby,[18] having a cesarean section,[17,18] having the postpartum "blues,"[9] breast-feeding,[19] having disturbed sleep,[18] and having experienced recent life stress.[18] Infant characteristics that have been associated with maternal emotional problems include being premature,[18] male,[20] temperamentally difficult,[21] and undergoing stressful childcare events, such as those related to illness.[22]

Several reports have shown a positive association between mothers' psychological well-being and their partners' emotional support, or conversely between mothers' mental distress and marital problems or lack of partner support.[2,4,7,9,18,22–24] Other family dynamics that have been related to maternal emotional problems include financial difficulties[24,25] and having three or more children in the household.[24] Social factors outside the family, particularly the support of other relatives and friends, have been associated with good postpartum mental health.[23] The relation of mothers' postpartum health to other important variables, such as physical symptoms and job characteristics, remains unknown.

The purpose of this study was to investigate changes in women's mental health during the first postpartum year, to determine the time of onset and duration of mental symptoms, and to examine the relation of women's demographic characteristics, physical health, social support, length of maternity leave, and work hours to their postpartum mental health. Work-related variables were of particular interest because of the multiple challenges faced by the growing number of women who are both raising children and working outside the home.

Methods

Procedure and Participants

Women giving birth to their first child at one of two St Paul hospitals between January 1 and December 31, 1989, were visited by a nurse research assistant who described the study to the mothers and determined their eligibility and willingness to participate. Criteria for inclusion in the study were: English-speaking, married, primiparous, having no other children in the household, and either currently or recently employed (sometime during pregnancy). Women who met these criteria and were willing to participate completed an enrollment form. Marital status, employment status, and parity were used as inclusion criteria for the purpose of limiting the number of confounding variables that might affect outcomes.

Hospital 1 was located in a suburban community comprising primarily a white middle-to-upper-income population; hospital 2 was situated in the inner city and served a diverse cultural and socioeconomic group. Subsequent to their enrollment, participants were mailed questionnaires at 1, 3, 6, 9, and 12 months postpartum. Women who did not return their questionnaires within 2 weeks were recontacted by telephone or letter, several times if necessary.

Of 4463 total deliveries occurring at the two hospitals during the study period, 557 women qualified to participate in the study. Only 34 (6.1%) of this initial group refused to participate. Of the remaining 523 women, another 31 were dropped to further control for important miscellaneous variables. This group consisted of 9 nonwhites, 4 women who gave birth to twins, 16 who became pregnant again during the follow-up period, and 2 who were participating in another similar study. An additional 56 women (11.4%) were excluded when they failed to complete one or more of the five questionnaires. The final sample used for analysis included 436 white, English-speaking, married primiparas who were or had recently been employed.

Questionnaires

Each of the five questionnaires contained information about mental and physical health, social support, recreational activities, job status, length of maternity leave, number of hours spent at work per week, infant health, breast-feeding, and satisfaction with appearance. The enrollment form also requested information about demographic characteristics (age and income), general health, and delivery type; the questionnaire mailed at 1 month postpartum included questions about the infant's peri-

natal course and the mother's chronic health problems and complications with pregnancy, labor, and delivery.

Mental Health

The mental health scales used in this study were taken from the Mental Health Inventory used in the RAND Health Insurance Experiment.[26] This inventory is a 38-item measure of psychological distress and well-being developed for use in general populations. The results of field tests including four large samples show a high-order structure consisting of two correlated factors (psychological distress and well-being) and five correlated lower-order factors (anxiety, depression, emotional ties, general positive affect, and loss of behavioral or emotional control). These factors, or scales, have been found to have high internal consistencies and moderate stability coefficients.[26] The current study used four of the Mental Health Inventory scales, which were combined into a total mental health score: "mental health" = general positive affect (10 items) + life satisfaction (1 item) − depression (4 items) − anxiety (9 items). The term *early postpartum mental health* in this study refers to the composite mental health score obtained at 1 month postpartum.

Physical Health

Physical health was assessed by a previously tested checklist of 76 physical symptoms or problems.[27] Participants were asked to check any problems they had experienced within the previous 2 weeks. This checklist included symptoms of the cardiovascular and respiratory systems, gastrointestinal and genitourinary systems, musculoskeletal and endocrine systems, skin, hair, breasts, head, eyes, ears, nose, throat, as well as complaints of fever, fatigue, and undesirable changes in weight. Subscales were created for breast symptoms, gynecologic symptoms, respiratory symptoms, fatigue, and other physical symptoms not included in the other subscales. These subscales were treated as separate independent variables.

Other measures of physical health investigated at each interval included average hours of sleep during a 24-hour period, number of days ill during the previous 2 weeks, and smoking and drinking status. To assess general health, women were asked to rate their general health before becoming pregnant on a 1-to-5 scale. In addition, chronic health problems were investigated at 1 month postpartum by having women check which of several disorders they had experienced in the past (eg, allergies, diabetes, heart problems, depression, hypertension, asthma, malignancies, and arthritis). The total number of chronic problems was then summed.

Complications with Pregnancy, Labor, and Delivery

Women checked which of 17 pregnancy-related problems they had experienced (eg, gestational diabetes, depression, hypertensive disorders, placenta previa, and bleeding), and their responses were summed. Similarly, women were asked to indicate which of 15 labor and delivery complications they had encountered (eg, hemorrhage, cesarean or other instrumental delivery, pitocin augmentation for failure to progress, fetal distress, hypertension, infection, and pre- or postterm delivery). The item "other" was included in each scale. These two summed scales were used as separate independent variables.

Social Support

Two questions about emotional support were adapted from Cohen's Dimensions of Social Support Scale[28]: "How often over the past 2 weeks did your husband make you feel he cared about you?" and "How often in the past 2 weeks did your other friends or relatives make you feel they cared about you?" A third question was asked to determine how often friends or relatives other than the husband had provided practical help during the previous 2 weeks. A fourth question, adapted from Blake's Tangible Support Scale,[29] required mothers to indicate how many people excluding the husband they would feel comfortable calling on in times of difficulty or trouble. Finally, mothers were asked how satisfied they were with their husbands' contributions to household chores (scale of 1 to 5).

Work, Recreational, and Social Activities

Participants were asked to indicate whether they were now doing much less, the same, or much more of four household work activities (Work Activity Scale) and five recreational activities (Recreational Activity Scale) as compared with the period before pregnancy. Mothers were also asked to indicate whether they were participating in too many social activities, a satisfactory number of social activities, or whether they wished to be involved in more social activities.

Each time they completed a questionnaire, women were asked whether they had returned to work, and if so, how many weeks of maternity leave they had taken and how many hours per week they were working. Two indicator variables were created for the impact of length of maternity leave on mental health. The variables of 9 to 24 weeks and more than than 24 weeks were compared with a baseline length of leave of less than 9 weeks in the regression analyses.

The Baby

Questionnaire items relating to the infant asked about the child's sex and how many days during the previous 2 weeks the infant had experienced minor illnesses (eg, colds), moderate illnesses (eg, infections requiring antibiotics), and serious illnesses (eg, those requiring hospitalization). A score for infant illnesses was calculated using the following formula: Infant illnesses = (minor illness days × 1) + (moderate illness days × 2) + (serious illness days × 3). Mothers were also asked at 1 month postpartum whether their infants had been admitted to a special care nursery at any time since birth.

Miscellaneous Items

On the initial questionnaire, participants designated their age, delivery type (vaginal or cesarean section), and their annual family income at the time they were working. At each time interval, the mothers were asked whether they were breast-feeding and how satisfied they were with their appearance at that time, compared with before becoming pregnant (scale of 1 to 5).

Analysis

Internal consistency reliability for the general positive affect, depression, and anxiety scales were evaluated using Cronbach's coefficient alpha. Changes in general positive affect, life satisfaction, depression, anxiety, and overall mental health over time were determined by analysis of covariance, using hospital and delivery type as covariates (vaginal delivery vs cesarean section).

Recognizing that the prevalence of depression in the first postpartum year approaches 20%, the 20% of participants with the lowest mental health scores were analyzed separately. This group consisted of 86 women who had an overall mental health score of < -10 at any of the five time intervals. This is a conservative cutoff, given that the point two standard deviations (SD) below the mean for the summed scores in the RAND study was calculated to be 4.09 ($\bar{X}$ = 28.43; SD, 12.17). A chi-square test was performed to determine whether low scores occurred randomly over time or otherwise. The proportion of women with newly developed low mental health scores at each point in time was determined by the following formula ("case" is defined as a woman with a mental health score of < -10):

$$\text{New case rate} = \frac{\text{New cases}}{\text{Total women} - \text{previous new cases}}$$

Using the entire sample, Pearson's correlation coefficients and exploratory regression analyses were performed for women's total mental health scores. The factors that seemed to be significantly related to mental health at any one point in time were included in subsequent forced entry regression analyses for each of the five testing periods. The exception was maternity leaves of 9 to 24 weeks, which, though not significant, were included for comparison purposes. Using this method, regression coefficients could be compared among several independent variables within one time interval, and for a single variable across time.

Several variables appeared not to be significantly related to mental health and therefore were excluded from the final analyses: chronic health problems; complications of pregnancy, labor, and delivery; delivery type; breast-feeding; breast symptoms; gynecologic symptoms; respiratory symptoms; use of cigarettes and alcohol; household work activities; social activities; practical help offered by friends and relatives; infant's sex; infant admission to a special care nursery; and maternal education and current job status.

Results

This sample of 436 women had a mean age of 28.2 years (SD, 4.0) and an average annual family income of $40,000 to $49,999; a majority had some education beyond high school. Their self-reports of general health before pregnancy were high, with a mean of 4.3 on a 1-to-5 scale (SD, 0.7). Seventy-eight of the women in this study (17.9%) had cesarean sections. The 1-month questionnaire was returned an average of 27.7 days after delivery (SD, 14.4), the 3-month at 90.0 days (SD, 10.1), the 6-month at 181.0 days (SD, 11.8), the 9-month at 273.4 days (SD, 17.5), and the 12-month at 365.8 days after delivery (SD, 13.7). The percentage of women who were back at work at 1 month postpartum was 5.7%; at 3 months, 57.8%; and at 6 months, 80.3%. From 6 months on, the number of women who were back at work remained stable. Internal consistencies for the mental health scales were: .93 for general positive affect, .87 for depression, and .91 for anxiety.

Changes in Mental Health During the First Postpartum Year

Changes in general positive affect, life satisfaction, depression, and anxiety are shown on Table 1. Scores for depression and anxiety were least favorable at 1 month postpartum and most favorable at 12 months postpartum. Positive affect was also lowest at 1 month but peaked

Table 1. Changes in General Positive Affect, Life Satisfaction, Depression, and Anxiety During the First Postpartum Year ($N = 436$)

Variables	Mean Scores (SD)* for Each Time Interval					Significance† Across Time	Paired Differences Significant at $P < .05$ Across Time
	1 Month	3 Months	6 Months	9 Months	12 Months		
General positive affect	39.12 (8.17)	40.53 (8.40)	39.77 (8.33)	39.82 (8.69)	40.27 (8.60)	NS	—
Life satisfaction	4.42 (0.95)	4.35 (0.95)	4.30 (0.90)	4.24 (0.96)	4.31 (0.95)	NS	—
Depression	10.04 (2.81)	9.48 (3.16)	9.44 (3.13)	9.22 (3.07)	8.99 (2.99)	$P < .001$	1 vs 6, 9, 12
Anxiety	19.89 (6.22)	18.47 (6.34)	19.12 (6.60)	18.67 (6.85)	18.28 (6.53)	$P < .01$	1 vs 3, 9, 12

**For comparison purposes, the means (SD) reported in the RAND Health Insurance Experiment were: 45.64 (9.56) for General Positive Affect, 4.27 (1.03) for Life Satisfaction, 8.05 (2.97) for Depression, and 19.15 (6.85) for Anxiety.[26]*

†Significance across time was determined by analysis of covariance, with hospital and delivery type as covariates.

at 3 months, whereas life satisfaction scores were highest at 1 and 3 months. Mental health outcomes did not appear to be influenced by whether women had cesarean sections or vaginal deliveries. Figure 1 illustrates changes in overall mental health, with the lowest values at 1 month postpartum and the highest at 3 and 12 months postdelivery.

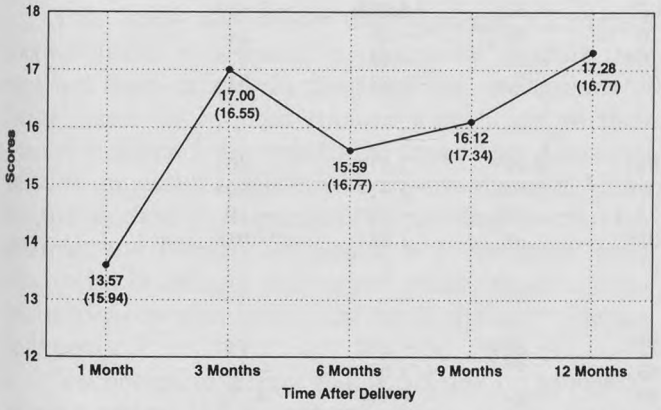

Figure 1. Changes in overall mental health mean scores (SD) of 436 women during the first postpartum year. The mental health score for each woman was calculated by adding scores for general positive affect and life satisfaction, and subtracting scores for depression and anxiety. Analysis of covariance (by hospital and delivery type) showed that changes over time were significant, with 1-month scores being significantly lower that 3- and 12-month scores ($P < .01$), and differences between hospitals were significant ($P < .01$), with women from hospital 2 having more favorable scores. There were no significant differences in mental health between the cesarean and vaginal delivery groups.

Women with Low Mental Health Scores

Figure 2 shows the total number of women with low (< -10) mental health scores at each point in time, as well as the number of women who had low scores for the first time. For the 86 women who had one or more low scores at some time during the year, the average number of low-score episodes was 1.9. Approximately one half of the 86 women had only one low mental health score during the year, 20 women had two low scores, 11

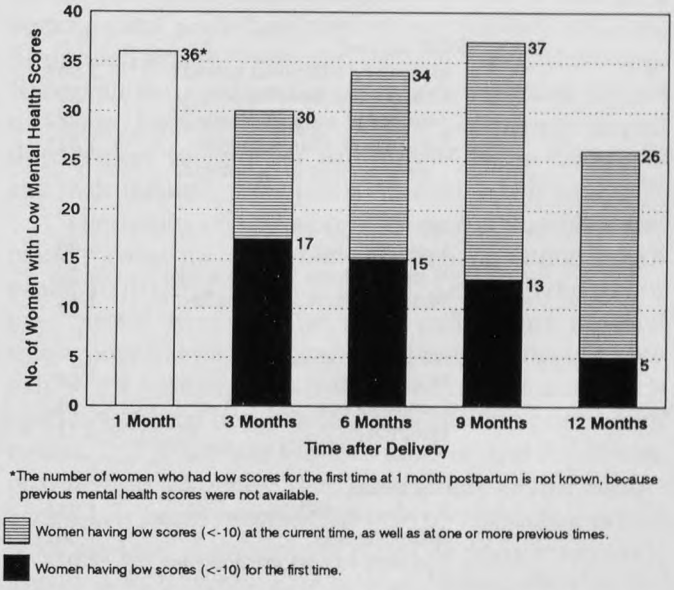

Figure 2. Number of women with low mental health scores (< -10) for each postpartum interval (n = 86).

women had three, 9 women had four, and 2 women had low scores at each of the five testing periods. Sixteen of the single-episode low scores occurred at 1 month postpartum, 5 at 3 months, 10 at 6 months, 8 at 9 months, and 5 at 12 months.

Chi-square analysis showed that the low scores did not occur randomly and independently at each time period ($P < .001$). There were more women with no low scores as well as more women with three or more low scores than would have been expected if the low scores had occurred in a random and independent manner. The proportion of total cases that were new at each point in time steadily decreased: 19.8% at 3 months, 17.4% at 6 months, 15.1% at 9 months, and 5.8% at 12 months. The 1-month rate could not be calculated because the number of new cases for this period was unknown.

It should be noted that even though the proportion of new cases was greater in the early postpartum period, over one half of the women with low scores (58% of the cases) developed low mental health scores at some time after the first postpartum month.

Factors Related to Mental Health

Regression analyses performed for five postpartum intervals showed that mothers' mental health was significantly associated with several factors: mothers' early postpartum mental health; general health; physical health factors, such as number of days ill, fatigue, sleep disturbances, and other miscellaneous physical symptoms; social support variables, including emotional support from spouses and other persons, number of support persons, and satisfaction with husbands' household help; infant illnesses; factors related to mothers' work, including length of leave and number of job-related work hours; and miscellaneous variables, such as maternal satisfaction with appearance, recreational activities, age, income, and hospital (Table 2). Factors that remained significant throughout most or all of the year included maternal early postpartum mental health, fatigue, other physical problems, satisfaction with husband's household help, mother's work hours, and spousal emotional support.

Table 2. The Relationship (Reported in Regression Coefficients) of Mother's Mental Health to Other Health, Demographic, and Social Factors at Five Postpartum Intervals

Independent Variables	1 Month	3 Months	6 Months	9 Months	12 Months
Maternal health					
Previous mental health	—	.40*	.38*	.40*	.42*
General health	4.19*	−.83	1.92‡	.67	.70
Fatigue	−6.40*	−7.03*	−4.81†	−8.20*	−5.46*
Sleep	1.73†	.16	.99	−.15	.54
Illness days	−.11	−.78*	−.36	−.48‡	−.82*
Other physical symptoms	−.37	−.51‡	−.72‡	−1.03*	−.81†
Social support					
Husband's emotional support	2.96*	1.84†	2.20†	2.51*	1.30‡
Others' emotional support	.30	2.07†	1.96†	1.42	2.50*
Number of support people	.28‡	.23	−.10	−.20	−.10
Satisfaction with husband's participation in housework	1.51‡	1.03‡	.38	1.55†	2.01*
Work-related factors					
Mother's work hours	−.00	−.17†	−.13‡	−.16‡	−.14‡
Maternity leave 9 to 24 weeks	−.29	−1.63	.32	1.62	−.08
Maternity leave >24 weeks	1.41	1.48	2.22	3.44‡	3.76‡
Demographic variables					
Maternal age	−.08	.40‡	.28	−.11	.09
Family income	.84‡	.55	.19	.74	.62
Hospital	3.71†	−1.03	.53	−.67	.08
Other factors					
Satisfaction with appearance	1.75‡	.50	1.85†	−.06	.02
Infant illnesses	−.36‡	−.19	.05	−.07	.13
Mother's recreational activities	1.02*	.37	.40	.37	.46‡
R^2	.37	.55	.47	.51	.57

*P < .001. †P < .01. ‡P ≤ .05.

Discussion

The results of this study show that, for this population, there was a change in mothers' overall mental health during the year after giving birth. In general, anxiety, depression, and overall mental health were worst a few weeks after delivery, and best at 1 year after delivery. The distribution of new onset low mental health scores also showed higher frequencies of new mental symptoms in the early postpartum period and progressively lower frequencies throughout the remainder of the year. Although these scores were not intended to diagnose specific psychiatric conditions, they do show a pattern of higher rates of new mental symptoms occurring in the early postpartum period, with progressively diminishing rates thereafter. These findings support the theory that for at least some women, postpartum mental symptoms are uniquely related to childbirth and are not simply randomly occurring problems that may have arisen regardless of their having had a baby.

The results of the regression analyses suggest that maternal postpartum mental health is at least related to and perhaps aggravated by factors commonly associated with having a new baby, such as infant illnesses or maternal fatigue, loss of sleep, and concerns about personal appearance. Although the analyses do not show causation, it seems likely that these factors could adversely affect maternal mental health. Mothers' mental problems also might contribute to their fatigue, sleep loss, and general appearance, and their infants' illnesses.

This study also shows that women's postpartum mental health was related to the social support they received from others. In fact, mothers' perceptions of being cared for by their spouses were linked to their mental well-being throughout the entire year. Also identified as important to maternal postpartum mental health are the mothers' perceptions of being cared for by other relatives and friends, satisfaction with husbands' assistance with household chores, and availability of a number of persons who could help out in the early postpartum period.

It is natural to assume that social support influences positive mental health outcomes, but it is also possible that the reverse occurs, ie, a woman's mental attitude may influence the degree of social support she receives. Our findings of a significant relation between maternal mental health and the presence of social support are consistent with other reports in the literature[23] and indicate a need to educate new parents about the importance of both emotional and practical support.

It is also important that new mothers receive work-related support. Length of maternity leave and number of work hours were both significantly related to new mothers' postpartum mental health. Approximately 80% to 83% of women in this sample returned to the workplace after delivery, and the average amount of time devoted to the job between the third and twelfth months was 35 hours per week, with a range of 2 to 81 hours. Women who had taken more than 24 weeks' maternity leave had better mental health outcomes at 9 and 12 months postpartum. Mental outlook was also brighter for women who spent fewer hours at their jobs. This relationship was significant at each point in time except at 1 month postpartum, when only 5.7% of women had returned to work. It is unclear whether a positive mental health outcome resulted from a mother's choice to take longer maternity leave and work fewer hours, or whether women who were emotionally healthy at the start tended to choose such work arrangements. However, it appears that taking a longer maternity leave and limiting work hours during the postpartum period may have positive health consequences for mothers with infants.

These job-related findings are noteworthy and indicate a need for work policies and benefits that provide flexibility and support for employed women who give birth. With more than one half of women returning to the work force after having a baby, the development of work-related support systems is especially critical.

Several other findings of this study were expected. Mothers' mental health was positively related to their early postpartum mental health, general health, age, family income, and recreational activities, and negatively related to other physical problems. As with other factors, the causal relationship between mental health and recreational activities is unclear. Either the women who have better mental health have more energy for such activities, or the activities themselves induce a sense of well-being. Randomly designed studies are needed to further explore this issue. Previous findings relating postpartum mental disturbances to cesarean section,[17,18] breast-feeding,[19] and male infants[20] were not confirmed in this study.

The results of this study also provide useful information about the onset and duration of mental health problems in the postpartum period. Although the rate of new mental symptoms of study participants declined throughout the year, it is important to note that over one half of the women with mental declines initially developed low mental health scores after the first postpartum month. It is important for both mothers and health care providers to recognize that postpartum mental disturbances may begin months after delivery. Because mothers often see their physicians for only one postpartum visit, usually 4 to 6 weeks after delivery, symptoms that develop after this visit may go unheeded. Therefore, new mothers should be warned about the signs and symptoms

of depression and instructed to contact their physicians should such problems develop. Family physicians are in a unique position to screen for postpartum mental disorders throughout the first year, not only at a postpartum visit a few weeks after delivery but also at subsequent well-child appointments. During these visits, the physician might also discuss timing of the return to work, use of work-related benefits such as part-time or flexible hours, and the importance of engaging the support of family and friends.

Because this study was conducted with a select population (white, married, employed, first-time mothers from an upper Midwest city), these results cannot be generalized and should be confirmed in more diverse populations. This investigation is also limited by the use of maternal self-report data. For example, it is not known whether participants gave an accurate account of their obstetrical complications. Future studies could verify such information with that provided in the patients' medical records. Investigations of the benefit of additional job-related supports, such as on-site child care, sick child care, and the option to work at home, also would be useful.

Many mothers in this study experienced adverse changes in mental health following childbirth. These changes were associated with shorter maternity leaves, longer work hours, infant illnesses, low levels of support, and physical problems that often accompany childbirth. These findings support the hypothesis that mental disturbances in the postpartum period are unique in that they are associated with and often caused or aggravated by events related to childbirth. It is important that clinicians recognize the potential for mental disturbances in women who have recently given birth and the factors that may contribute to or alleviate these problems.

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