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Maternal Depression, Changing Public Assistance, Food Security, and Child Health Status

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ABSTRACT. *Objective.* To examine the association of positive report on a maternal depression screen (PDS) with loss or reduction of welfare support and food stamps, household food insecurity, and child health measures among children aged ≤ 36 months at 6 urban hospitals and clinics.

Methods. A convenience sample of 5306 mothers, whose children < 36 months old were being seen in hospital general clinics or emergency departments (EDs) at medical centers in 5 states and Washington, District of Columbia, were interviewed from January 1, 2000 until December 31, 2001. Questions included items on socio-demographic characteristics, federal program participation and changes in federal benefits, child health status rating, child's history of hospitalizations since birth, household food security status, and a 3-question PDS. For a subsample interviewed in the ED, whether the child was admitted to the hospital that day was recorded.

Results. PDS status was associated with loss or reduction of welfare support and food stamps, household food insecurity, fair/poor child health rating, and history of child hospitalization since birth but not low child growth status measures or admission to the hospital at the time of ED visit. After controlling for study site, maternal race, education, and insurance type as well as child low birth weight status, mothers with PDS were more likely to report fair/poor child health (adjusted odds ratio [AOR]: 1.58; 95% confidence interval [CI]: 1.33–1.88) and hospitalizations during the child's lifetime (AOR: 1.20; 95% CI: 1.03–1.39), compared with mothers without PDS. Controlling for the same variables, mothers with PDS were more likely to report decreased welfare support (AOR: 1.52; 95% CI: 1.03–2.25), to have lost food stamps (AOR: 1.56; 95% CI: 1.06–2.30), and reported more household food insecurity (AOR: 2.69; 95% CI: 2.33–3.11) than mothers without PDS.

Conclusion. Positive maternal depression screen status noted in pediatric clinical samples of infants and toddlers is associated with poorer reported child health status, household food insecurity, and loss of federal financial support and food stamps. Although the direc-

tion of effects cannot be determined in this cross-sectional survey, child health providers and policy makers should be aware of the potential impact of maternal depression on child health in the context of welfare reform. *Pediatrics* 2004;113:298–304; *welfare reform, food insecurity, child health status, maternal depression.*

ABBREVIATIONS. C-SNAP, Children's Sentinel Nutritional Assessment Program; PDS, maternal depression screen; ED, emergency department; OR, odds ratio; AOR, adjusted OR.

Depression is common in women of all ages, particularly among women who are mothers of young children.¹ Depressive symptoms are noted more commonly in women in clinical, particularly nonscheduled, settings,^{2,3} in ethnic minorities, and in low-socioeconomic-status families.^{1,4–7} Related risk factors include marital disharmony, housing dissatisfaction, and financial distress.

Since 1996, all states in the United States have implemented welfare reform in response to federal legislation (Personal Responsibility and Work Opportunity Reconciliation Act), which has resulted in the loss of cash assistance, food stamps, or both in many families.⁸ From 1994 to 1999, the national caseload of Aid for Dependent Children declined by 8 million recipients,^{9–11} and the average monthly food stamp program caseload declined by 9.3 million recipients. Welfare-reform activities have progressed even more aggressively in most states since 1999. The potential impact of welfare reform on families may be positive due to greater self-esteem associated with joining the workforce. However, this advantage may not result in increased financial security. If the potential for increased financial distress in families is realized, one would expect an increased prevalence of depression in the mothers of these families.

From a pediatric perspective, maternal depression is associated with increased probability of problems in behavior, emotion, and development in their children across the developmental age span.^{1,12–15} These associations likely result from ineffective parent-child interaction^{16,17} and problematic parenting approaches¹⁸ along with the negative effects of related environmental factors such as marital disorder.^{14,19} To date, however, little is known about the association of maternal depression or depressive symptoms

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with child health or on family characteristics such as food insecurity that may influence child health.

Household food security has been defined by national experts as the consistent access at all times to enough food for an active, healthy life by all household members. Two hallmarks of food security are 1) ready availability of nutritionally adequate and safe foods and 2) an assured ability to acquire acceptable foods in socially acceptable ways.^{20,21} Food insecurity, like maternal depression, is more common in impoverished families. Although there are few published studies describing the impact of nutrient intake and health and developmental status in children who live in households that report food insecurity, some reports have found negative health and development effects on children in such families.^{22,23} There are no reports that assess the potential association of maternal depression and household food insecurity.

The Children's Sentinel Nutritional Assessment Program (C-SNAP) is a multisite collaborative study designed to monitor the impact of changing economic conditions and public policy resulting from federal welfare reform on children's health and growth status. This study provided the opportunity to screen for the presence of maternal depression in a large multiethnic group of mothers living in 6 metropolitan communities in 5 regions of the United States while their children were being assessed in a clinical care setting. The maternal depression screen was added to the C-SNAP survey 1 year after its inception for the specific purpose of assessing the association of maternal depressive symptoms to child health status in the context of welfare reform. Specifically, this study assessed the relationship of self-reported depressive symptoms to reported child health status, frequency of child hospitalizations, child growth status, reported regular access to adequate food supply (food security), and loss of welfare and food stamps.

Thus we addressed the following research questions: 1) Do mothers who respond positively on the depression screen report lower food security and greater loss of food stamps and federal financial support from welfare? 2) Do children whose mothers respond positively on a depression screen have poorer child health as evidenced by lower growth status, poorer reported health status, and more hospitalizations? Both questions were addressed while controlling for confounding demographic variables.

METHODS

Setting

C-SNAP conducted household-level surveys and medical record audits between August 1998 and December 2001 at medical centers that serve children in Baltimore, Maryland, Boston, Massachusetts, Little Rock, Arkansas, Los Angeles, California, Minneapolis, Minnesota, and Washington, District of Columbia. Primary adult caregivers accompanying children 0 to 3 years old presenting at hospital emergency departments (EDs) and primary care clinics at the centers were interviewed in private settings during wait periods. Potential respondents were excluded if they did not speak English, Spanish, or Somali (Minneapolis only), if they were not knowledgeable about the child's household, if the child's caregiver had been interviewed within the previous 6 months, or if they refused consent for any reason. Institutional review board

approval was obtained at each site. Respondents gave informed consent to study participation. They were told that they were free not to answer any questions that made them feel uncomfortable and to terminate participation at any time without jeopardizing their access to medical care.

Sample

The C-SNAP sample is a convenience sample obtained by scheduling interviewers in the EDs and clinics to coincide with peak patient flow times. The maternal depression screen questions were added to the maternal interview January 1, 2000, and the sample used in this article includes all interviews from then through December 31, 2001.

Of the 7811 caregivers approached in these 2 years, 6665 (85%) were eligible for interview. Of them, 6102 (92%) successfully completed the interview, whereas 458 (7%) refused to be interviewed and 105 (1%) did not complete the interview. Of the 6102 completed interviews, 626 were with nonmaternal respondents and excluded from the analyses. Of the 5476-person maternal sample, 170 (3%) were missing information from the depression screen and were excluded from the analyses. The final analytical sample includes 5306 maternal respondents with complete data. Mothers who completed interviews were compared with those who did not and showed no statistical differences in maternal education, marital status, employment, child gender, or reported household food security. Mothers with noncompleted interviews were more likely to have no insurance, to be non-US-born, and to describe their ethnicity as other than white, Hispanic, or African American.

Measures

The interview questionnaire included items on household sociodemographic characteristics, federal assistance program participation, changes in federal program benefit levels, child health status, whether the child had been hospitalized since birth, food security, and maternal depression screen questions. Based on receipt of federal food stamps and federal financial assistance (Temporary Assistance to Needy Families) during the 12 months preceding the interview, families were categorized as: 1) sanctioned: terminated or reduced by full family or partial sanctions for failure to comply with behavioral requirements; 2) decreased: benefits decreased administratively due to increased income or decreased expense (eg, from employment or changes in marital status); 3) not decreased: benefits either increased or did not change; or 4) never on federal financial assistance/food stamps.²⁴

At 3 study sites, caregivers were interviewed in conjunction with ED visits. Overall, 3216 (61%) of the 5306 interviews in the analytic cohort were obtained from 3 ED sites: Boston ($n = 1545$; 48%), Little Rock ($n = 934$; 29%), and Los Angeles ($n = 737$; 23%). Separate analyses were conducted by using data from this subsample, with admission the day of the visit as the outcome.

The number of times each child in the analytic cohort had been hospitalized since discharge after birth was obtained from caregiver interview. This information was used to create a second hospitalization variable (yes or no) indicating whether the child had been hospitalized since birth (excluding the day of the interview). The caregiver's report of the child's overall health status was asked in standard form as used in the Third National Health and Nutrition Examination Survey.²⁵ Household food security status was measured by the US Department of Agriculture's 18-item Food Security Scale and categorized as "food secure" or "insecure" in accordance with established procedures.^{20,21} The 3-item maternal depression screen developed by Kemper et al²⁶ was used to screen for maternal depression. This instrument had a sensitivity of 100%, a specificity of 88%, and a positive predictive value of 66% when compared with the 8-item Rand screening instrument. As recommended by the author, the 3-item instrument was considered positive if a respondent had a positive response to any 2 of the 3 items. The child's weight and length and whether the child was admitted to the hospital at the time of the clinical visit were obtained from medical record review. Low growth status was defined as weight for age <5% and weight for length <10% by using National Center for Health Statistics norms.

Statistical Analyses

Bivariate associations between positive maternal depression screen (treated as a categorical variable) and other categorical

variables used χ^2 tests; *t* tests were used for bivariate associations with continuous variables. Separate sets of logistic regression models were specified to model the association of PDS with loss or reduction in Temporary Assistance to Needy Families assistance and food stamp benefits, child health variables, and household food security while controlling for multiple potentially confounding variables as identified by bivariate analyses. These variables controlled in regression analyses included study site, low birth weight (<2500 g), maternal race, health insurance type, and maternal education status.

RESULTS

Table 1 depicts sample demographics of the interviewed sample and the percent who scored positive on the maternal depression screen. Of the interviewed sample, 51.4% were African American, 76.3% had public medical assistance, 39.6% had not graduated from high school, and 52.1% were single or divorced. Thirty-five percent of the mothers who completed the interview scored positive on the maternal depression screen.

Mothers who scored positive on the depression screen varied significantly in bivariate analyses by ethnicity ($P < .001$; greatest in Hispanic and least in African American women), study site ($P < .001$), insurance status ($P < .01$; greatest in public and least in private insurance), educational level ($P < .001$; greatest in less-than-high-school-graduate group), and marital status ($P < .05$; least in married group).

Table 2 depicts the unadjusted odds ratio (OR) comparing those positive or not on the maternal depression screen on food security status and change in federal financial and food stamp support. There were statistically significant differences in the frequency of positive PDS and those with changed federal financial support, greatest in families with decreased benefits (OR: 1.5; $P < .05$). Forty-five percent of mothers who reported decreased financial benefits scored positive on the depression screen (data not shown). Positive depression screen was also associ-

ated with change in food stamp support, highest in families who were sanctioned (OR: 1.89; $P < .0001$). Positive maternal depression screen was strongly associated with food insecurity (OR: 2.6; $P < .0001$). Almost 53% of mothers who reported food insecurity scored positive on the maternal depression screen (data not shown).

The association between measures of child health and positive maternal depression screen are depicted in Table 3. Mothers who scored positive on the maternal depression screen were more likely to report their child's health as fair to poor (OR: 1.6; $P < .0001$) and more likely to report that their children had been previously hospitalized since birth (OR: 1.3; $P < .001$). There was no association between positive maternal depression screen and whether a child was underweight or whether the child had been admitted to the hospital on the day of the ED visit.

Table 4 depicts the association between child health outcomes and positive maternal depression screen after adjusting for potentially confounding factors. Mothers who scored positive on the maternal depression screen were more likely to report child health status as fair or poor (adjusted odds ratio [AOR]: 1.58; $P < .0001$) and to report their children had been hospitalized since birth (AOR: 1.21; $P = .01$). There was no relationship between positive PDS and children being underweight or admitted to the hospital on the day of visit.

Table 5 depicts AORs comparing positive versus negative maternal depression screen after change in federal financial support and food stamps and household food insecurity after adjusting for potentially confounding variables. There were no differences in PDS with those families whose federal financial support was sanctioned compared with not reduced. PDS was more likely reported in families with decreased federal financial support versus families with no change in federal support (AOR: 1.52; $P = .03$). Positive PDS was reported more commonly in families whose food stamps were sanctioned (AOR: 1.56; $P = .02$), when compared with families whose food stamps were not reduced.

Mothers who scored positive on the maternal depression screen were considerably more likely to report household food insecurity (AOR: 2.69; $P = .0001$) than mothers who were negative on the maternal depression screen, even after controlling for confounding variables.

DISCUSSION

Thirty-five percent of the mothers in this sample were positive on the maternal depression screen. This prevalence is very similar to that found in other inner-city pediatric clinical populations^{2,4} and a Head Start sample.²⁷ PDS is associated with changes in federal financial assistance and food stamp support (while controlling for many independent confounding demographic variables). In addition, while controlling for these same variables, PDS is associated with household food insecurity status, lower maternal reported child health status, and more hospitalizations during the child's lifetime.

Although there are several theoretical discussions

TABLE 1. Prevalence of Positive Maternal Depression Screen Within Demographic Categories

	<i>n</i>	% of Total	% Positive PDS
Ethnicity*			
African American	2729	51.4	31.0
Caucasian	632	11.9	37.8
Hispanic	1840	34.7	39.0
Site†			
Baltimore	394	7.4	38.3
Boston	1545	29.1	35.8
Little Rock	934	17.6	36.4
Los Angeles	757	14.3	29.6
Minneapolis	1381	26.0	32.1
Washington	295	5.6	42.4
Insurance status‡			
Public	4025	76.3	35.9
Private	679	12.9	29.5
None	569	10.8	31.6
Education*			
<High school	2095	39.6	37.6
High school graduate	1891	35.8	33.1
>High school	1302	24.6	32.1
Marital status‡			
Single	2451	46.3	37.0
Married	2539	47.9	32.2
Divorced	309	5.8	36.6

* $P < .001$; † $P < .01$; ‡ $P < .05$.

TABLE 2. Association Between Maternal Depression Screen and Change in Federal Assistance/Food Security

Outcome	Positive Depression Screen (n = 1836)	Negative Depression Screen (n = 3470)	OR	95% CI
Welfare status (%)*				
No decrease	17.6	18.2	1.00	—
Sanctioned	8.4	6.7	1.29	(1.01, 1.66)
Decreased	3.2	2.2	1.55	(1.07, 2.25)
Never on welfare	70.8	73.0	1.00	(0.86, 1.17)
Food stamp status (%)†				
No decrease	27.6	26.2	1.00	—
Sanctioned	3.6	1.8	1.89	(1.31, 2.74)
Decreased	7.6	4.8	1.49	(1.15, 1.91)
Never on food stamps	61.2	67.1	0.87	(0.76, 0.99)
Food security status (%)†				
Secure	67.1	84.3	1.00	—
Insecure	32.9	15.7	2.63	(2.30, 3.00)

CI indicates confidence interval.

* $P < .05$; † $P < .0001$.**TABLE 3.** Association Between Maternal Depression Screen and Child Health Utilization and Outcomes

Outcome	Positive Depression Screen (n = 1836)	Negative Depression Screen (n = 3470)	OR	95% CI
Child health rating (%)*				
Excellent/good	84.3	89.8	1.00	—
Fair/poor	15.7	10.2	1.64	(1.39, 1.94)
Child past hospitalizations (%)†				
No	77.5	81.5	1.00	—
Yes	22.5	18.5	1.28	(1.11, 1.47)
Low child growth measurements (weight/age <5% or weight/height <10th percentile) (%)‡				
No	85.5	84.9	1.00	—
Yes	14.5	15.1	0.95	(0.81, 1.12)
Admitted to hospital at time of visit (Boston, Little Rock, and Los Angeles) (%)‡				
No	86.6	87.5	1.00	—
Yes	13.4	12.5	1.09	(0.88, 1.35)

CI indicates confidence interval.

* $P < .0001$; † $P < .001$; ‡ not significant.**TABLE 4.** Association Between Maternal Depression Screen and Child Health Utilization and Outcomes Adjusted for Covariates

Outcome	OR	95% CI	P Value
Child health fair/poor	1.58	(1.33, 1.88)	<.001
Child past hospitalizations*	1.20	(1.03, 1.39)	.010
Admitted to hospital	1.05	(0.84, 1.31)	.680
Low child growth measurement (weight/age <5% or weight/height <10%)	0.92	(0.78, 1.09)	.336

Outcomes were adjusted for study site, race, insurance type, education, and low birth weight. CI indicates confidence interval.

* Also adjusted for age of child.

regarding the potential impact of welfare reform on families, mothers, and their children, empirical data are more sparse.^{28–31} Recent reports demonstrate the negative effect of loss of financial support on children's development.^{32,33} In a recent review, it was noted that many families will likely face decline in income from direct loss of benefits and also from related barriers to employment such as poor physical and mental health, inadequate past employment experience, and low education.⁸ This income decline, of course, may affect child health and development status in many ways including reduced access to

TABLE 5. Association Between PDS and Change in Federal Assistance and Food Insecurity

Outcome	OR	95% CI	P Value
Welfare			
Sanctioned vs not decreased	1.19	(0.90, 1.57)	.222
Decreased vs not decreased	1.52	(1.03, 2.25)	.035
Food stamps			
Sanctioned vs not decreased	1.56	(1.06, 2.30)	.025
Decreased vs not decreased	1.26	(0.97, 1.65)	.089
Food insecurity	2.69	(2.33, 3.11)	<.001

Outcomes were adjusted for study site, race, insurance type, education, and low birth weight. CI indicates confidence interval.

health care or quality child care. In these families, mental health problems such as depression and substance abuse may be associated with difficulty in obtaining and maintaining an adequate job, whether as a cause or effect.³⁴ Depression may compromise a mother's ability to benefit from interventions, whether directed toward their employment and education³⁵ or their parenting skills.³⁶ In both experimental interventions, improvements were found only in those mothers who were not depressed at the beginning of the intervention, whereas depressed mothers showed no benefits from the interven-

tion.^{35,36} Mothers' emotional state has been shown to be associated with material circumstances. Worry about debt was the strongest independent socioeconomic predictor of maternal depression in a separate longitudinal study of 271 families with young children.³⁷ Our results, which demonstrate associations with positive PDS and loss or reduction of food stamps and financial assistance, suggest that maternal affect as well as loss of resources may be mechanisms by which welfare reform impacts children's well being.

Food insecurity is found more commonly in families who live in poverty. In 1999, 10.9% of all families reported food insecurity, whereas 46% of those with income below the poverty line reported food insecurity.³⁸ A higher percentage of families who report food insecurity receive food stamps and other nutritional assistance as compared with those who report food security, indicating the nutritional fragility of these families.³⁹ Experts have anticipated negative effects of welfare reform on food security, because almost 50% of federal savings resulted from reduction in food stamps and other child nutrition support programs.⁴⁰ We recently demonstrated increased probability of reported household food insecurity in families whose federal support or food stamps were sanctioned or reduced.²⁴ Families who live below the poverty line, who typically have no "savings" to fall back on, have little or no discretionary money for spending when "income shocks" of any type occur, such as increase in rent, cost of gasoline, or cost of household heating/cooling or, even worse, loss of income or food stamps.⁴¹ Purchasing adequate quality and quantity of food may be compromised in favor of these other necessities.⁴² Loss of food stamps is of particular concern, because food stamps have been shown to increase the intake of nutrients in children of impoverished families.⁴³ Maternal depression thus is predictable in times of financial distress and food shortage. PDS in our sample was strongly associated with household food insecurity, independent of many confounding variables. This finding is of particular concern, because food insecurity has been shown to have a negative effect on child health and development status (while controlling for family income and related demographic variables).^{22,23,44}

Maternal depression and even subthreshold depressive symptoms have been associated with an array of childhood learning and behavioral problems and childhood psychopathology.^{12-15,45} Few studies have demonstrated the effects of maternal depression on child health. A higher rate of accidents has been found in children of depressed mothers compared with children of nondepressed mothers.⁴⁶ In a group of asthmatic children, those whose mothers reported depressive symptoms were more likely to have higher morbidity.⁴⁷ In 2 different cohorts of neonates³ and school-aged children with childhood asthma,² those whose mothers had depressive symptoms were more likely to have ED or problem-oriented primary care visits (after controlling for demographic and other variables), including asthma morbidity. In our convenience sample, mothers who

were positive on the maternal depression screen were more likely to report fair to poor child health status and increased likelihood of lifetime hospitalizations of the child (while controlling for demographic variables).

Our study has limitations that restrict the generalization and interpretation of the results. Ours is a geographically diverse sentinel population in which relatively high rates of clinical problems are expected to be found, which likely exceed the occurrence of problems in general populations. This is a nonepidemiologic sample studied cross-sectionally, and thus the relationship of cause and effect between variables cannot be evaluated. Almost all data in our study are self-reported in questionnaire format; the maternal responses may have been influenced by the environment of the clinical setting. It is possible that maternal depressive symptoms might lead the mothers to overstate their household's food insecurity and their child's ill health (although hospitalization since birth is a relatively objective measure). Finally, maternal depression was assessed by a brief, 3-question screen instrument. Although one cannot conclude that the respondents were depressed, such instruments that have been validated against other instruments are useful for screening and perhaps case-finding in primary care settings.^{48,49}

The relationship between the important variables in this study may be multidirectional and open to speculation. Within the context of poverty, depression is very common in women on welfare, and unsuccessful transition off of welfare and job acquisition may relate to preexisting depression. On the other hand, maternal depression may also result from the loss of welfare when sanctions have been imposed. Food insecurity and poor adult nutrition may be related to maternal depression and loss of federal financial assistance and food stamps either as a cause or effect. Finally, problems in child health and development status may result either from maternal depression, loss of financial support and food stamps, or food insecurity, each directly and independently or indirectly in a multifactorial causal pathway. Longitudinal research will be required to understand these causative pathways.

CONCLUSIONS

Positive maternal depression screen in a pediatric clinical sample is associated with reports of poorer child health status, food insecurity, and loss of federal financial support and food stamps, independent of many confounding variables. Pediatricians and other child health providers should be aware of the potential importance of maternal depression on the status of their patients' health, nutrition, development, and behavior in the context of welfare reform. Child health professionals might ask their state and local welfare agencies to make contact with the family to review their case before imposing a sanction that may jeopardize the physical or mental health of children or their parents. Some states have demonstrated the efficacy of evaluating families by identifying and treating barriers to successful transition such as maternal depression before the implementa-

tion of sanctions. Policy experts attempting to estimate the impact of welfare reform should consider maternal depression as one of the important cumulative risks for children and families.

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ABSENT PRESENCE

“A new plague of inattention is spreading. It’s called ‘surfer’s voice’—a habit of half-heartedly talking to someone on the telephone while simultaneously surfing the Web, reading e-mails, or trading instant messages. . . . On one end of the phone is an annoyed colleague or family member discussing an important topic. On the other end, a party puts on a meager soundtrack of knowing participation: ‘OK . . . uh-hum . . . right . . . OK.’ It is punctuated with surreptitious tapping of a keyboard.”

Berman DK. Technology has us so plugged into data, we have turned off. *Wall Street Journal.* November 10, 2003

Submitted by Student

Maternal Depression, Changing Public Assistance, Food Security, and Child Health Status

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