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Utilization of Mental Health Services by Low-Income Pregnant and Postpartum Women on Medical Assistance

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Abstract

This paper examines mental health service use among publicly insured white and African-American pregnant and postpartum women who live in a metropolitan area. The study examines the extent to which ethnicity, physical health problems, and behavioral health risk factors are associated with the probability of service use during the prenatal- postpartum period. It also analyzes the patterns of service utilization for those women who used mental health services.

Medicaid claims and eligibility data, County Reporting System claims and admissions data, and Pennsylvania State Vital Birth Records were integrated using a unique algorithm. Logistic regression was employed to estimate the probability of mental health service use among 3,841 low-income women residing in Philadelphia who were continuously enrolled in Medicaid for 9 months preceding delivery and 6 months postpartum. Analyses were also conducted on the intensity and location of service use, as well as psychiatric diagnosis, during pregnancy and the postpartum period.

About 10% of the women used mental health services during the study period. Women were more likely to use services if they were Caucasian, had a number of chronic diseases, had a number of pregnancy complications, and smoked. Among users, the same proportion (ca. 6%) used services during pregnancy and postpartum, with the average number of outpatient visits slightly higher during pregnancy than during the postpartum period. Most outpatient services (86%) were delivered in the specialty sector. Most women who used mental health services (84%) were diagnosed with minor psychiatric disorders including minor depression and anxiety disorders. Women who used services during the postpartum only were more likely to be diagnosed with major depression, whereas women who used services throughout the perinatal period were more likely to be diagnosed with severe mental disorders. Health providers can use information generated in this study to identify women who are likely to have a need for mental health services.

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KEYWORDS. Mental health services, pregnant, postpartum, low-income, women, utilization

The mental health of women during the prenatal and the postpartum period is a significant women's health concern. Psychiatric disorders that are present during that time not only affect the psychological well-being of the women themselves, but are also associated with an increased risk of emotional problems among their dependent children (Beck, 1998). Because psychiatric disorders are prevalent among women using public-sector gynecological clinics (Miranda, Azocar, Komaromy, & Golding, 1998), it is likely that low-income prenatal and postpartum women who are among clinic users also have a high rate of mental health difficulties.

Often considered a time of emotional well-being, pregnancy does not protect women from psychiatric symptoms and illnesses (Nonacs, Viguera, & Cohen, 2002). Previous studies have reported that up to 70% of pregnant women had depressive symptoms (Llewellyn, Stowe, & Nemeroff, 1997), between 10 and 16% met diagnostic criteria for major depression (Llewellyn et al., 1997), 17% screened positive for other depressive disorders (Kelly, Zatzick, & Anders, 2001), and about 30% screened positive for an anxiety disorder (Birndorf, Madden,

Portera, & Leon, 2001).[1] Psychiatric illnesses during pregnancy are a treatment challenge, as psychopharmacology presents risks to the fetus while untreated psychiatric illness can adversely affect the fetus, the quality of the mother's self-care, and her attention to prenatal care (Nonacs et al., 2002).

During the postpartum period, women are subject to "maternity blues," postpartum depression, and postpartum psychosis (Arnold, Baugh, Fisher, Brown, & Stowe, 2002). It is common for mothers to feel anxious, confused, and mildly depressed in the weeks following childbirth, but these symptoms are usually short-lived (Arnold et al. 2002). Postpartum depression is less common; postpartum psychosis is severe but relatively rare (Arnold et al., 2002). Chaudron et al. (2001) found that 5.8% of their study participants were clinically depressed between 1 and 4 months postpartum. A Finnish study of women using a maternity center found that 28.1% had minor psychiatric symptoms after delivery (Vünamäki, Niskanen, Pesonen, & Saarikoski, 1997). An American community study of postpartum women found point prevalence rates of 8.7% at 14 weeks and 16.8% at 30 weeks for anxiety and 23.3% and 18.7%, respectively, for depression (Stuart, Couser, Schilder, O'Hara, & Gorman, 1998).

In an analysis that linked the hospital records of women who had given birth with birth certificates, Kelly et al. (1999) found that 1.5% had a diagnosis of a psychiatric or substance disorder. The frequency of psychiatric diagnosis alone or dual diagnoses was 0.6%. The authors concluded that because these percentages are considerably below rates reported in the literature for pregnant women, obstetricians are underreporting these disorders in their discharge summaries. In another study (Kelly et al., 2001), women receiving prenatal care at a university-based obstetrics clinic were assessed for psychiatric disorders and substance abuse and, after delivery, had their obstetrical charts reviewed. The researchers found that although 26% of the women were screened positive for any psychiatric disorder, only 18% of this group had treatment recorded in their charts (Kelly et al., 2001). If not identified and properly treated, psychiatric problems in the perinatal period and subsequent childbearing years may lead to continuing or recurrent major psychiatric disorders, resulting in higher medical cost and exacerbating the risk of emotional problems among dependent children (Beck, 1998). For these reasons, it is important to investigate the use of mental health services by pregnant and postpartum women.

This paper examines the mental health service use by African-American and Caucasian women who were on Medicaid for a 15-month preg-

nancy-postpartum period. The study assesses the extent to which ethnicity, physical health problems, and behavioral health risk factors are associated with the probability of mental health service use among members of the study population; and examines the patterns of service utilization during pregnancy and the postpartum period.

ETHNICITY

Research on the use of mental health services has found that despite unmet need, members of ethnic minority groups are less likely to avail themselves of these services than whites (e.g., Shapiro et al., 1985; Swartz et al., 1998). There are, however, inconsistencies among studies (Snowden, 1999) and a more recent follow-up study indicates a narrowing of the racial disparity in utilization (Cooper-Patrick et al., 1999).

Most relevant to the present study are those that have investigated ethnic group differences in service use after controlling for health insurance coverage. In an examination of the Medicaid population, Temkin-Greener and Clark (1988) found that white women made significantly more outpatient mental health visits than African-American and Hispanic women. A study of mental health service use by employees enrolled in the high option Blue Cross/Blue Shield Federal Health Benefits Plan from 1979 to 1981 found that African-Americans and Hispanics had a lower probability of use of mental health services than whites (Scheffler & Miller, 1989). (The high option plan allowed for more mental health visits and required a higher co-payment than the other plan.) Using a similar data set, but including both high and low option insurance plans for 1983, other researchers found that the probability of mental health service use by white women was considerably higher than that of ethnic minority women (Padgett, Harman, Burns, & Schlesinger, 1998). Consistent with these findings, we expect that African-American pregnant and postpartum women have a lower rate of mental health use than their white counterparts.

PHYSICAL HEALTH PROBLEMS

In the general population, persons with physical illnesses are at risk of emotional and mental health problems (Wells, Golding, & Burnam, 1988). One study of postpartum women found that those who reported 10 or more somatic symptoms were more likely to develop depression

by four months postpartum than those reporting fewer such symptoms (Chaudron et al., 2001). Accordingly, we expect that pregnant and postpartum women who report multiple chronic health problems during pregnancy would have added worries about themselves, motivating them to seek relief through mental health services. Furthermore, we expect that women who have pregnancy complications might be anxious about the outcome of their pregnancies or the well-being of their child and seek support from a mental health professional.

BEHAVIORAL HEALTH RISK FACTORS

Alcohol use and smoking are risk factors associated with low birth-weight babies (Institute of Medicine, 1985). Studies of women in gynecological and obstetric clinics or hospitals have found that rates of alcohol abuse and dependence are relatively high (e.g., 11.7% in Miranda et al., 1998). A study of tobacco use within the Medicaid population in Wisconsin found that some 45% smoked, a rate that is twice that of the general population (Carr, Chritiansen, Jehn, & Matitz, 2001). Miranda et al. (1998) found that 32 percent of their public sector sample smoked. Although none of these studies directly addresses mental health service use, it is possible that alcohol use and smoking are associated with higher levels of anxiety and depression, which in turn increase the probability of mental health service use among pregnant and postpartum women.

PRENATAL AND POSTPARTUM MENTAL HEALTH SERVICE USE

Literature on women's mental health gives little attention to service utilization during the pregnancy and postpartum periods. Some research, however, has tried to disentangle the distribution of depression between these two periods among clinical cases. Gotlib et al. (1989), who followed a sample of women through pregnancy and the postpartum period, reported that 10.2% of their sample met diagnostic criteria for minor and major depression during pregnancy and 6.8% did so about 4 weeks postpartum. Among those in the latter group, half were diagnosed during pregnancy and half were new cases. One-third of the cases diagnosed during pregnancy remained depressed in the postpartum period. With respect to depressive symptoms, Gotlib et al. (1989)

found similar proportions prenatally and postpartum. Ritter, Hobfoll, Lavin, Cameron, and Hulsizer (2000), who were investigating depressive symptomatology among inner city women receiving obstetrical services during both periods, reported that there was a decline in depressive symptoms and dysphoria 7 to 9 months postpartum. However informative, these findings focused exclusively on the prevalence of depressive diagnosis and symptomatology and did not cover other psychiatric problems. They do not provide us with guidance on the extent to which service utilization patterns vary during pregnancy and the postpartum period. This investigation will contribute to knowledge by looking at the prevalence of mental health service use during the perinatal period, the pattern of service use by diagnosis, and the intensity and location of service use (i.e., general medical and specialty mental health sectors).

On the basis of the above review, we are testing three hypotheses regarding the probability of service use. Among low-income perinatal women (1) African-American ethnicity is associated with a lower probability of mental health service utilization; (2) physical health problems during pregnancy are associated with a higher probability of mental health service utilization; and (3) behavioral health risks during pregnancy are associated with a higher probability of mental health service utilization. These hypotheses are tested controlling for the effects of sociodemographic factors including age, years of education, marital status, number of children, and basis for eligibility for Medicaid (AFDC, General Assistance, Healthy Beginnings). In addition, we are exploring patterns of mental health service use.

METHODS

Study Population

The study site was Philadelphia County, which has a Medicaid enrollment of about 300,000 persons, or 20% of the county's population. The study population comprised 3,841 white and African-American women between 15 and 45 years of age who were continuously eligible for Medicaid for nine months preceding delivery and six months postdelivery, and who delivered babies between January 1, 1992 and December 31, 1992. The study population excludes Medicaid-eligible women who were enrolled in the Supplemental Security Income (SSI) program because of the substantive difference between the basis for

Medicaid eligibility through participation in SSI and other public assistance programs.[2]

Native Americans, Alaskan Natives, and Asians were not included in the study because the number of Medicaid-eligible women from each of these groups was too small for statistical analysis. Although Hispanic women comprised a sufficiently large subgroup, they were excluded from the study because there were questions about the accuracy of the claim records from one clinic serving primarily the Hispanic population. African Americans and whites were analyzed.

Databases

The study used three publicly accessible administrative data sets: (1) Medicaid Management Information System (MMIS) data, including eligibility data and claims data; (2) County Reporting System (CRS) data; and (3) Pennsylvania State Vital Birth Records of 1992 (Birth Records). The MMIS data were derived from a claims-based information system for services provided to Medicaid-eligible clients. The CRS database, maintained by the county's Office of Mental Health, was composed of claims and admissions data from the 12 community mental health centers in operation during the study period. Specific to the purpose of this study, the CRS records provided information on the receipt of mental health services that were not reimbursable under Medicaid. The Birth Records were obtained from the Division of Health Statistics, Pennsylvania Department of Health. The information on utilization of mental health services among the study population was obtained from the first and the second databases (MMIS and CRS), and the information on the sociodemographic characteristics of the mothers and the pregnancy-related risks was from the third database (Birth Records). Tables 1 and 3 in the results section specify in the footnotes the data sources from which the study variables were drawn.

The three administrative databases were integrated using a unique algorithm. The MMIS claims data files identified study subjects, women who delivered babies on Medicaid in Philadelphia from January 1 to December 31, 1992. After identifying members of the designated population, the study's index date–i.e., the infant's date of birth–was obtained from the Birth Records. The analysis traced the incidence of mental health service use by mothers ascertained from the claims data (MMIS and CRS) during pregnancy and the postpartum period, which is operationally defined as covering pregnancy (9 months before delivery) and the postpartum period (6 months after delivery). After match-

TABLE 1. Characteristics of the Study Population by Service Use (n = 3,841)

Characteristics	Users (n = 396)	Total (n = 3,841)
Control variables: demographics & eligibility		
Average age (in years)**[a]	25.8	24.4
Average years of education (in years)[a]	11.2	11.3
Currently married (%)**[a]	12.4	8.0
Average number of children**[a]	2.2	1.9
Medicaid-eligibility category (%)*[b]		
AFDC	83.9	88.3
GA	13.6	9.9
Healthy Beginnings	2.5	1.8
Ethnicity (%)**[a]		
Black	70.7	82.6
White	29.3	17.4
Physical health problems		
Chronic physical illnesses[a]		
Having chronic illnesses (%)**	12.4	8.8
Average no. of chronic illnesses**	1.4	0.1
Pregnancy complications[a]		
Having pregnancy complications (%)*	29.6	24.8
Average no. of pregnancy complications*	0.33	0.26
Behavioral health risk factors		
Drinking during pregnancy (%)[a]	4.8	4.3
Smoking during pregnancy (%)**[a]	47.5	37.0

Data sources:
[a] Pennsylvania State Vital Birth Records.
[b] Medicaid Management Information System (MMIS) eligibility data.
* indicates that difference between users and nonusers is statistically significant at the 0.05 level.
** indicates that difference between users and nonusers is statistically significant at the 0.01 level.

ing with Medicaid eligibility files, the study subjects were limited to women continuously eligible for Medicaid during pregnancy and the postpartum period, that is, 15 months. After the exclusion of Native American, Alaskan Native, Asian, Hispanic women, and those with Medicaid eligibility based on SSI, a total of 3,841 African-American and white women remained for this analysis.

Reliability and Validity

In order to address the problems of reliability and validity that may arise from the analysis of secondary data collected for routine adminis-

trative purpose, this study used a data management protocol that includes reliability and validity auditing of data elements, and the maintenance of data standards (Rothbard, Shinnar, Hadley, & Rovi, 1990). Specifically, the redundancy of sociodemographic information was identified across the three databases, thereby enabling checks on the consistency of these data elements. Algorithms linking individual patients across databases were used to ensure that linked information is for the same client. Questionable cases were dropped. Similarly, editing routines were developed to identify inconsistencies in service use information. Although possible limitations may exist with secondary administrative data used in the study, it has been found that the consistency rates on relevant utilization and client characteristic elements were over 95%.

Another concern is the trustworthiness of the birth records data in providing information on physical and behavioral health risks experienced by members of the study population during pregnancy. Each risk variable used in this study, including drinking during pregnancy, cigarette smoking, and the number of chronic physical illnesses and pregnancy-related problems, was based on self-reports made by mothers on the birth worksheet in the hospital after delivery. Although there are limitations with the self-report data, including recall bias, misclassification error, and missing data, these data are still considered the most complete and reasonably reliable source of information on prenatal care utilization available for all births in the United States (Griffin, Hogan, Buechner, & Leddy, 1999). Birth records data have been used in previous studies, especially for the prenatal care utilization research (Haas, Udvarhelyi, Morris, & Epstein, 1993; Piper, Ray, & Griffin, 1990).

Measures

Probability of mental health service use. The three sets of *independent variables* for hypotheses testing are ethnicity, physical health problems, and behavioral health risk factors. The ethnicity variable was coded "1" if the mother's ethnicity was reported as African American, and "0" if white. Physical health problems included the number of chronic physical illnesses reported by the study subject during pregnancy (i.e., cardiac disease, lung disease, anemia, diabetes, chronic hypertension, and HIV disease) and the number of pregnancy-related complications (i.e., pregnancy-associated hypertension, eclampsia, incompetent cervix, renal disease, RH sensitization, uterine bleeding, and other medical complications). Behavioral health risk factors during pregnancy included drinking and cigarette smoking. Each of the two

factors was treated as a categorical variable and was coded "1" if there was a reported drinking problem or use of cigarettes, and "0" if otherwise.

Several sociodemographic and eligibility characteristics were used as statistical *controls*. Demographic characteristics included the mother's age, mother's education (years of schooling), the number of children born prior to the index childbirth, and mother's marital status. All variables with the exception of marital status were interval-ratio measures. Marital status was coded "1" if the study subject was currently married and "0" if otherwise. Eligibility for Medicaid was indicated by two dummy variables: General Assistance and Healthy Beginnings.[3] Eligibility based on AFDC is the omitted category.

In the multivariate analysis, mental health service use during the 15-month pregnancy and postpartum period was the *dependent variable*. Use denoted at least one episode of inpatient or outpatient service use and was coded "1," whereas non-use was coded "0."

Patterns of service use. We are examining patterns of service use in relation to four variables–time period, intensity, location of service use, and psychiatric diagnosis. *Time period of service use* was constructed as a three-category variable indicating women who used services during pregnancy only, those who used services during postpartum only, and those who used services during both periods. *Intensity of service use* was measured by the number and length of inpatient episodes, and the number of outpatient visits. *Location of service use* was indicated by whether services were provided by the general medical sector or the specialty mental health sector. Service use from the specialty mental health sector was indicated by claims records from mental health specialists such as psychiatrists, psychologists, psychiatric social workers, and community psychiatric nurses, whose services were provided at community mental health centers and psychiatric outpatient clinics. Types of outpatient mental health services received from the specialty mental health sector included partial hospitalization, psychiatric rehabilitation, vocational rehabilitation, drug management, case management, and emergency services. Service use from the general medical sector covered those claim records with psychiatric codes from physicians and non-physician providers from general hospitals, obstetrics and gynecology offices, and other outpatient and health clinics.

Data on *psychiatric diagnosis* were available for each inpatient episode and outpatient visit. The study divided psychiatric diagnosis into three groups, based on the DSM-III-R criteria–severe mental disorders, major depression, and minor psychiatric disorders. Severe mental disor-

ders included schizophrenia, delusional disorder, psychotic disorder not otherwise specified, and autistic disorder. Major depression included a single-episode severe depression and recurrent severe depression. Minor psychiatric disorders were comprised of adjustment disorders, post-traumatic stress disorder, separation anxiety disorders, personality change due to general medical conditions, and depressive disorder not otherwise specified.

Data Analysis

Probability of mental health service use. Chi-square and *t*-tests were used to compare sociodemographic and eligibility category control factors, ethnicity, physical health problems, and behavioral health risk characteristics of women who used mental health services and those who did not. Hierarchical logistic regression was used to calculate odds ratios (ORs) for predicting the probability of mental health services use. Sets of variables were sequentially added to the regression model. First, we entered all the control variables, including demographic characteristics and eligibility factor. Second, we added ethnicity to the model and tested whether white and African-American women have different probabilities of mental health service. Third, we added to the second model the set of variables indicating physical health problems and behavioral health risks. Focusing on the potential change in the coefficients of the ethnicity variable in the third model will ascertain whether the ethnic difference in service use was accounted for by physical health problems and behavioral health risk factors.

Patterns of service use. Chi-square and ANOVA tests were used to compare mental health service utilization by time period of service use. Data on intensity of service use, location of service use, and psychiatric diagnoses were analyzed, respectively, for inpatient service use and outpatient service use. We also undertook additional bivariate analyses on pattern of service use by psychiatric diagnosis.

RESULTS

Probability of Mental Health Service Use

Table 1 describes the study population and users of mental health services. As the last column of Table 1 shows, members of the study population were predominantly African American, were relatively young,

had an average of less than 12 years of schooling, already had one to two children at the time of the index childbirth, and were largely unmarried. The majority of the women (88.3%) were eligible for Medicaid because of their enrollment in AFDC; close to 10 percent and 2 percent of the women, respectively, were Medicaid-eligible through participation in General Assistance and Healthy Beginnings. One-quarter of the study population experienced some pregnancy complications. The percentages of women who reported chronic illnesses and who used alcohol were relatively small, 8.8 percent and 4.3 percent, respectively. More than one-third of the study population smoked during pregnancy, a rate that is higher than that of the general population, but close to the findings of Miranda et al.'s (1998) study of women using public-sector gynecologic services.

Among the study population (n = 3,841), 10.3% (n = 396) used a mental health service at least once during each woman's 15-month perinatal period. Relative to the ethnic distribution of the study population, users of mental health services were less likely to be African American, with 70.7% of the users, in contrast with 82.6% of the study population, African American. Chi-square and *t*-tests that were used to compare services users and non-users found that mental health service users were somewhat older, more likely to be married, and had a greater number of children. There is no statistical significance in years of schooling between service users and non-users. Interestingly, women with AFDC were under-represented among the user group, whereas women with General Assistance and Healthy Beginnings were over-represented. Overall, mental health service users experienced more chronic health problems and pregnancy-related complications and were more likely to smoke during pregnancy relative to the study population. There is no statistically significant difference between users and non-users in the proportion that reported drinking during pregnancy.

The logistic regression results in Table 2 indicate that African-American women had a lower probability of mental health service use than white women. Controlling for other variables in the model, African-American women were half as likely as white women to use services. The parameter estimates for the ethnicity variable do not change when additional sets of variables were included in the model, indicating that ethnic difference in mental health services use is not accounted for by physical health problems and behavioral health risk factors.

Consistent with our hypothesis, all indicators of physical health problems and behavioral health risks, with the exception of drinking during pregnancy, are positively related to mental health service use

TABLE 2. Logistic Analysis on Use of Mental Health Service (n = 3,841)

	Estimate	Odds Ratio	Estimate	Odds Ratio	Estimate	Odds Ratio
Control variables: demographics & eligibility						
Age in years	0.041	1.041 **	0.036	1.036 **	0.027	1.028 *
Education in years	−0.106	0.900 **	−0.075	0.928	−0.056	0.945
Marital status (currently married = 1)	0.339	1.405	0.173	1.189	0.214	1.239
Number of children	0.075	1.078 *	0.092	1.096 *	0.085	1.089 *
Eligibility factors (omitted category: AFDC)						
Healthy Beginning	0.493	1.638	0.396	1.486	0.425	1.531
General Assistance	0.414	1.513 *	0.361	1.435 *	0.315	1.371
Ethnicity						
Race (Black = 1)			−0.685	0.504 **	-0.704	0.495 **
Physical health problems						
Number of chronic physical illnesses					0.361	1.434 **
Number of pregnancy-associated complications					0.278	1.320 *
Behavioral health risk factors						
Drinking during pregnancy					−0.208	0.812
Smoking during pregnancy					0.247	1.280 *
2X Loglikelihood (df)		*57.395(6)*		*89.045(7)*		*109.200(11)*

*$p < 0.05$, **$p < 0.01$

among low-income perinatal mothers. Two control variables, age (older) and the number of children (higher), influence the probability of mental health service use among perinatal women.

Patterns of Service Use

The percentage of women who used mental health services during pregnancy (248 of 3,841) and the postpartum period (247 of 3,841) is about the same–that is, 6.5% of the study population used services during pregnancy and 6.4% during the postpartum period. Women who used mental health services during both pregnancy *and* the postpartum period (99 of 3,841) constituted 2.6 percent of the study population. In Table 3, we classified service users into three non-overlapping groups: women using services during pregnancy only (n = 149, 37.6%), women using services during the postpartum period only (n = 148, 37.4%), and women using services during both pregnancy and the postpartum period (n = 99, 25.0%).

All women using mental health services (n = 396) reported at least one outpatient visit. As panel one of Table 3 shows, the average number of outpatient visits made by women who used mental health services during both periods (26.1 visits) is nearly six times that for women who used services during pregnancy only (4.5 visits) and women who used services during the postpartum period only (4.4 visits). Eighty-six percent of all outpatient visits took place in the specialty sector.

There were significant differences in the distribution of diagnoses by time period. Proportionately more women in the "postpartum only" group received a diagnosis of major depression. Interestingly, but not surprising, there were proportionately more women in the "both periods" group who were diagnosed with severe mental disorders. Regardless of the time period of service use, the majority of service users were diagnosed with minor psychiatric disorders, including minor depression and anxiety disorders.

More than one in 10 service users (10.6%) experienced at least one inpatient episode; the mean number of inpatient episodes is 1.2 for women who were ever hospitalized during the study period. Although there was no significant difference in the proportion ever hospitalized among users of the three groups, women who used services during both pregnancy and the postpartum periods reported more inpatient episodes, and stayed in hospital longer than women who used services during pregnancy only and postpartum only. All inpatient psychiatric services were delivered in the specialty sector.

TABLE 3. Patterns of Mental Health Service Use by Time Period of Service Use (n = 396)

Service Use Pattern	Pregnancy Only (n = 149)	Postpartum Only (n = 148)	Both Periods (n = 99)	Total (n = 396)
Outpatient service use[a,b]				
Average no. of outpatient visits (s.d.)**	4.5 (6.8)	4.4 (5.6)	26.1 (46.0)	9.8 (25.4)
Service site for use per episode (%)[#]				
General sector only	82 (12.2)	119 (18.5)	339 (13.1)	540 (13.9)
Specialty sector or both	589 (87.8)	525 (81.5)	2242 (86.9)	3356 (86.1)
Diagnosis for outpatient visits (%)[~]**				
Severe mental disorders	11 (7.4)	6 (4.1)	13 (13.1)	30 (7.6)
Major depression	5 (3.4)	20 (13.5)	7 (7.1)	32 (8.1)
Minor psychiatric disorders	133 (89.3)	122 (82.4)	79 (79.8)	334 (84.3)
Inpatient service use[a]				
Ever hospitalized (%)	16 (10.7)	14 (9.5)	12 (12.1)	42 (10.6)
Average no. of hospitalizations (s.d.)**	1.1 (0.3)	1.0 (0.0)	1.6 (0.7)	1.2 (0.5)
Mean no. of hospital stay days per episode (s.d.)[#]	11.0 (14.5)	17.4 (9.0)	28.6 (21.1)	18.1 (16.6)
Service site for use per episode (%)[#]				
Specialty sector	17 (100)	14 (100)	19 (100)	50 (100)

Data sources:
[a] Medicaid Management Information System (MMIS) claims data.
[b] County Reporting System (CRS) claims and admission data.
Note:
[#] Because the data are episode-level, there is no test of statistical significance by time period of use.
[~] Most service users had one psychiatric diagnosis only. For those with multiple diagnoses, only the most serious diagnosis was included. For example, an individual with diagnoses of major depression and minor psychiatric disorders was classified as having major depression. An individual diagnosed with severe mental disorder and major depression was classified as having severe mental disorder.
*p < 0.05, **p < 0.01

    As noted, women who used services during both pregnancy and the postpartum period tended to make more outpatient and inpatient visits and stayed longer when hospitalized. There were proportionately more women in the "both periods" group receiving a diagnosis of severe mental disorder. To ascertain whether the differential patterns of service utilization by time period of use were accounted for by psychiatric diagnosis, we conducted an additional analysis based on diagnostic category.

    Table 4 shows that women diagnosed with severe mental disorders were more likely to be hospitalized than those who were diagnosed with major depression or minor psychiatric disorders. The average length of stay per inpatient episode is also longer for women with severe mental

TABLE 4. Pattern of Mental Health Service Use by Psychiatric Diagnosis (n = 396)

Service Use Pattern	Severe Mental Disorders (n = 30)	Major Depression (n = 32)	Minor Psychiatric Disorders (n = 334)	Total (n = 396)
Inpatient service use				
No. of service users hospitalized (%)*	7 (23.3)	6 (18.8)	29 (8.7)	42 (12.6)
Total no. of prenatal hospitalizations	5	3	18	26
Total no. of postnatal hospitalizations	3	6	15	24
Total no. of hospitalizations	8	9	33	50
Mean no. of days stayed per hospitalization#	29.1	20.4	15.0	18.1
Outpatient service use				
Mean no. of outpatient visits**	45.0	8.8	6.8	9.8
Total no. of prenatal outpatient visits	749	97	1204	2050
Total no. of postnatal outpatient visits	601	183	1062	1846
Total no. of outpatient visits	1350	280	2266	3896

Because the data are episode-level, there is no test of statistical significance by psychiatric diagnosis.
*$p < 0.05$, **$p < 0.01$

disorders than for other diagnostic groups. Consistent with the results on inpatient care, women in the severe mental disorders category made an average of 45 outpatient visits during the 15-month perinatal period, compared to 8.8 made by women in the major depression category and 6.8 made by women in the minor psychiatric disorder category. For the severe mental disorder and the minor psychiatric disorder groups, there are numerically more inpatient and outpatient episodes during pregnancy than during the postpartum period. By contrast, for the major depression group, 6 out of 9 hospitalizations and two-thirds of outpatient visits occurred during the postpartum period, suggesting a heightened incidence of severe postpartum depression.

DISCUSSION

Using data integrated from three publicly accessible administrative datasets, the present research is one of the few studies that track mental health services use among low-income white and African-American women during the perinatal period. We found that about 10.3% of the Medicaid-eligible women used mental health services during pregnancy and the postpartum period.

The descriptive data on the study population (Table 1) illuminate some of the physical and behavioral health risks that low-income women may experience during the pregnancy-postpartum period. It is notable that the rate of smoking among all low-income pregnant women is relatively high. The proportion that smoked among mental health service users (47.5%) here is similar to that found in a survey of Wisconsin Medicaid recipients, reportedly twice the rate in the general population (Carr et al., 2001). The Wisconsin sample included children age 11 and older as well as men and women and thus is more inclusive than the population studied here. Because smoking during pregnancy can adversely affect the child, smoking is a serious concern in maternal and child health. The findings on pregnancy complications (29.6% of the mental health service users and 24.8% of the study population) also appear to be high. Drinking was found to be not sizable, did not turn out to be a factor that distinguished users and non-users, and was not associated with mental health service use.

The logistic regression results (Table 2) supported all three hypotheses. With regard to the association between African-American ethnicity and mental health service use, we found that when other factors were controlled, African-American women had a 50% lower probability of

using mental health services than Caucasian women. The finding of an ethnic gap in mental health service use is consistent with the prior research (Padgett et al., 1998; Temkin-Greener & Clark, 1988) and suggests that there might be significant unmet need among African-American women for mental health services. It may be, as Mays, Caldwell, and Jackson (1996) found of African-American women in general, that African-American pregnant and postpartum women do not seek services for mental health problems until those disorders become severe. Alternatively, African-American women may not find services to be sufficiently culturally sensitive (Takeuchi & Uehara, 1996). Further research is needed to determine whether this difference is due to attitudes toward help-seeking during pregnancy, the severity of symptoms, the quality of services, or some other factor.

Furthermore, the study found that physical and behavioral health risk factors were associated with mental health service use. The finding on physical illnesses was consistent with previous research showing an association between chronic diseases and psychiatric disorders (Wells et al., 1988). The finding of the number of pregnancy-associated complications is a new one. It may be that these complications provoke anxiety in women, which in turn motivates them to seek help through mental health services. As expected, we found that smoking was associated with service use. Drinking during pregnancy, however, did not turn out to be significant.

Two sociodemographic control variables, age and the number of children, were also associated with service use. It is not surprising that age predicted service use, because age brings maturity and awareness of the availability of services to address problems. This finding does, at first glance, seem inconsistent with that of the Padgett et al. (1998) study, which reported that younger women were more likely to use mental health services than older women. This discrepancy, however, is attributable to a different distribution of the age group in the two studies. Compared with the average age of participants of Padgett study ($M = 48$ years, range = 18 to 65), the participants in this study were considerably younger ($M = 24$ years, range = 15 to 45).

The number of children was also associated with mental health service use. Women with more children were more likely to seek help from mental health professionals. This finding might be explained by higher role demands, which may result in stress among poor mothers (Belle, 1990). The demands of caring for numerous children may motivate women to seek emotional support through mental health treatment. Two sociodemographic control variables, education and marital status,

were not significant predictors in our regression analysis, even though others have found that these were associated with mental health service use (Padgett et al., 1998).

This study goes beyond previous research by exploring patterns of service use by time period of service use and by psychiatric diagnosis (Tables 3 and 4). About 6.5% of the study population used services during the prenatal period, 6.4% used services during the 6-month postpartum period, and 2.6% used services during both periods. The majority (84.3%) of women who used services received a diagnosis of minor psychiatric disorder, while 7.6% and 8.1% were diagnosed with severe mental disorders and major depression, respectively. All service users made at least one outpatient visit and 10.6% experienced psychiatric hospitalization. Outpatient service use was predominantly within the specialty mental health sector but a substantial proportion received mental health services through the general medical sector.

Although prior research did not identify any clear pattern regarding the prevalence of depression between pregnancy and the postpartum period (Gotlib et al., 1989; Ritter et al., 2000), this study found proportionately more women in the "postpartum only" group receiving a diagnosis of major depression. The relatively higher prevalence of major depression in the "postpartum only" group suggests that while minor depression may be common across the 15-month perinatal period, women are particularly vulnerable to single-episode or recurrent severe depression during the postpartum period.

Compared to other service users, a discernible pattern of service use emerged for women who received a diagnosis of severe mental disorder. As our findings show, proportionately more women who used services during both the pregnancy and postpartum periods received a diagnosis of severe mental disorder. Moreover, relative to their size, women with severe mental disorder consumed a disproportionate amount of mental health services. While only 7.6 percent of all mental health service users were women with severe mental disorder, these women made 34.7 percent of all outpatient visits (1,350 out of a total 3,896 visits, Table 4) during the entire study period.

Implications of the Study

The results of this study have implications for research and policy that are relevant to women's mental health care and the health and mental health service delivery systems. First of all, we have shown that African-American, low-income, pregnant, and postpartum women had a

50% lower probability of mental health service utilization than Caucasian women. Considering that this study controlled for access to health insurance by including the Medicaid population only, and controlled for a number of predictors of mental health utilization, our study suggests that guaranteeing equal access to public health insurance does not necessarily close the gap in use of mental health services between African American and white perinatal women.

The persistence of an ethnic gap at the point of entrance to psychiatric services obviously calls for future research on the availability of services (such as issues of geographic proximity, culturally-sensitive practices, and other barriers of the mental health system) and acceptability of services (such as beliefs and perceptions of mental disorders, mental health practitioners, and discrimination in the mental health system). Policies and programs that foster participation of all eligible groups would extend services to all ethnic groups that potentially benefit from mental health services. Qualitative research on the beliefs, attitudes, and perceptions of low-income pregnant and postpartum women can clarify the role of ethnicity, as well as other factors that are associated with the utilization and non-utilization of mental health services by this population.

Second, this study has implications for clinical practice. As reported above, and besides ethnicity, whether or not a woman seeks mental health services during the perinatal period is associated with physical and behavioral health risk factors and other demographic factors. Notably, smoking during pregnancy, multiple chronic physical illnesses, the number of pregnancy-related complications, age, and the number of previous childbirths affect the likelihood of mental health service use. In response, we suggest that health care providers for pregnant and postpartum women consider these predictors of mental health utilization as factors signaling attention to their mental health status and possible referral to a mental health provider. Primary physicians, obstetricians, and nurse practitioners and nurse midwives might, for example, explore potential psychological problems experienced by women in their late 20s or older, those with a large number of children, women who smoke, and those who have multiple chronic health problems and complications during pregnancy. These women may benefit from a referral to a mental health provider. Early identification and treatment of women experiencing symptoms of mental health problems during pregnancy and the postpartum period are essential to help prevent recurrent and/or severe mental illness, which would incur financial cost to the mental

health system as well as psychological cost to both patient and family members.

Similarly, the findings of this study could sensitize mental health practitioners to sociodemographic and physical and behavioral health risk factors that are associated with the use of, and conversely, avoidance of use of mental health services. Mental health providers might, for example, attend more closely than they ordinarily do to chronic physical illnesses and reported pregnancy complications by women with whom they are working. Furthermore, health and mental health providers can refer pregnant women who smoke for smoking cessation intervention services.

Third, the mental health service needs of women with severe mental disorders identified in this study warrant special attention of health care providers, both at the general health sector and the specialty mental health sector. In contrast with the other diagnostic categories, severe mental disorders are comprised of disorders that are less likely to emanate from the stresses and strains associated with pregnancy and childbirth and are also less likely to end after the perinatal period is over. Moreover, because of the psychopharmacologic risks during pregnancy, medication management is of particular concern for health care providers working with women with severe mental disorders. It is important for health care providers at the general medical sector to be equipped with the knowledge and skills for identifying members of this high-risk group through screening, case finding, and evaluation. Establishing effective linkages between providers of the general medical sector and the specialty mental health sector is critical for ensuring the continuity and quality of care in addressing the mental health needs of these women.

Limitations of the Study

The target population in this study included only those low-income women on Medicaid who had successfully delivered babies. Women who experienced fetal loss or otherwise did not have pregnancies that resulted in the existence of birth certificates were not in the study. We recognize that pregnancy loss may prompt some women to use mental health services. A further limitation was that the data did not have indicators for need for mental health care among the study population. Constrained by the administrative data, we cannot ascertain the extent to

which women who did not use mental health services have an actual need for services. Other studies have found that perceived or evaluated need is a significant predictor of mental health service utilization (e.g., Padgett et al., 1998).

NOTES

1. Llewellyn et al. (1997) provide full documentation for the percentages reported in their review. Birndorf et al.'s (2001) study was of a small sample (n = 57) of pregnant women at a faculty practice at a major medical center.

2. Eligibility for SSI is medically determined, based on physical or mental impairment, whereas other eligibility categories (including Aid to Family with Dependent Children, or AFDC, General Assistance, and Healthy Beginning) are determined by income level. We are excluding SSI recipients from the study because the basis for eligibility (psychiatric illness or chronic physical illness) confounds with the key variables used in this study.

3. Healthy Beginnings is a federal program that offers medical assistance to pregnant and postpartum women whose family income is up to a designated percentage above the poverty line.

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