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Access to Adequate Outpatient Depression Care for Mothers in the USA: A Nationally Representative Population-Based Study

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Abstract
Maternal depression is often untreated, resulting in serious consequences for mothers and their children. Factors associated with receipt of adequate treatment for depression were examined in a population-based sample of 2,130 mothers in the USA with depression using data from the 1996–2005 Medical Expenditure Panel Survey. Chi-squared analyses were used to evaluate differences in sociodemographic and health characteristics by maternal depression treatment status (none, some, and adequate). Multivariate regression was used to model the odds of receiving some or adequate treatment, compared to none. Results indicated that only 34.8% of mothers in the USA with depression received adequate treatment. Mothers not in the paid workforce and those with health insurance were more likely to receive treatment, while minority mothers and those with less education were less likely to receive treatment. Understanding disparities in receipt of adequate treatment is critical to designing effective interventions, reducing treatment inequities, and ultimately improving the mental health and health of mothers and their families.

Introduction
Maternal depression is a major public health issue, often with long-term adverse health outcomes for mothers and their families. Women with depression are more likely to engage in poor personal health behaviors, including smoking, lack of exercise, and sexual risk taking.[1] Among mothers, depression and adverse risk behaviors not only have important consequences for women's own health but may also have a profound negative impact on the long-term health, quality of life, and well-being of their children.[2–5]

Even though depression is a common and treatable disorder, adults are often underdiagnosed and undertreated[6–8] and most women go without treatment.[9] Clinical studies show that treatment for depression can improve the mental health status of adults in general.[10–13] Compelling results from the Sequenced Treatment Alternatives to Relieve Depression study underscore the importance of treating maternal depression, as it can lead to remission and reduce children's mental health symptoms and diagnoses.[14] Therefore, access to treatment for maternal depression is critical in improving maternal mental health and reducing the impact of depression on the family.

Despite this compelling evidence, little is known about maternal depression on a national level. Prior studies of the treatment of maternal depression have been clinic-based and conducted on convenience samples or among mothers who are receiving health care services. The referral patterns underlying the care that these women receive may limit the generalizability of the findings from these studies.[15]

Recent research has recognized the importance of considering not only the receipt but also the adequacy of depression treatment.[16, 17] Adequate treatment refers to the minimum amount of care

necessary to reduce and remove all signs and symptoms of depression, restore occupational and psychosocial function, and reduce the likelihood of relapse and recurrence.[18] However, no population-based study of mothers has directly examined the relationship between depression and access to *adequate* treatment for depression.

This paper uses the Aday and Anderson, or "behavioral model," which characterizes the determinants of health care use as need, enabling, and predisposing factors.[19, 20] Need factors include medically evaluated and self-perceived health problems and symptomotology; enabling factors refer to resources available to the individual or community, such as health insurance; and predisposing factors include an individual's demographic characteristics and health beliefs.[20] For this study, poor mental health is considered a potential need factor in the behavioral model.

This study sought to address gaps in the literature by examining access to adequate treatment for maternal depression within a population-based sample. Further, this study determined if disparities exist in accessing adequate treatment for maternal depression and explored whether particular subgroups may be at risk for receiving inadequate treatment. As a secondary aim, interactions between covariates were tested to gain greater insight into the relationship between the predisposing, enabling, and need factors and access to adequate treatment.

Methods

Study design, population, and data sources

Data are from the Medical Expenditure Panel Survey (MEPS), a nationally representative sample of the civilian noninstitutionalized population in the USA. MEPS uses an overlapping panel design to collect person and household data at five different time points (or rounds) throughout a 2-year period. Complete data from 10 panels of the 1996 to 2005 MEPS were pooled through a public use linkage file prior to analyses. Detailed methodology and a description of data available in MEPS are available at http://www.meps.ahrq.gov.meps.web.

The sample includes 2,130 mothers with depression who were interviewed about their health in one of 10 panels of the 1996–2005 MEPS. Mothers were identified as MEPS interviewees with at least one child (0–17 years). Subjects were excluded from the dataset if they had missing information on age, race, family size, education level, insurance type, marital status, employment status, region of the USA, Metropolitan Statistical Area (MSA), poverty status, functional limitations, health and mental health, or a zero person weight.

Identification of mothers with depression

Mothers with depression were identified through the Household Component or respondent interview of the MEPS, wherein the Condition Enumeration Section household respondents were asked if they had experienced any "health problems...as well as mental or emotional health conditions, such as feeling sad, blue, or anxious about something."[21] Truncated three-digit *International Classification of Diseases*, *Ninth Revision an* (ICD-9) codes were generated from the respondent interview. Mothers with an ICD-9 code of 296 or 311, during any round, were identified as having depression. While code 296 includes major depressive disorder and other episodic mood disorders, over 94% of mothers with depression in the sample were identified using code 311 (depression unspecified).

Measures

The variables described in this section are organized by the domains of the behavioral model, which are thought to influence mothers' use of treatment for depression: predisposing, enabling, and need factors.

Predisposing factors

The following maternal demographic characteristics were included in the analyses: maternal age (14–34, 35–44, and 45+), race/ethnicity (white non-Hispanic, black non-Hispanic, other non-Hispanic, and Hispanic), educational status (no or some high school, high school graduate, some college, and college graduate or beyond), maternal participation in the paid workforce, single-parent household status, family size (less than or greater than four people), urbanicity (urban versus rural by MSA status), and region of the USA (West, Northeast, Midwest, and South) as defined by USA Census regions.

Enabling factors

Health insurance status was grouped in the following mutually exclusive categories: no health insurance, any publicly funded health insurance (Medicaid and/or Medicare), and private health insurance only. The poverty threshold level (percent of poverty threshold below 100%, 100–199%, 200–399%, and 400% and higher) was also examined as an enabling factor to access to treatment.

Need factors

The following need factors were examined in the analyses: self-rated mental health status, self-rated health status, other mental health and chronic medical conditions, and functional limitation status.

Self-rated mental health status

Mothers were asked to rate their mental health at every round of the MEPS by responding to the question "In general, would you say that your mental health is excellent, very good, good, fair, or poor?" A dichotomous variable was used in the statistical analyses, comparing mothers reporting fair or poor mental health in any round to mothers reporting excellent, very good, or good mental health in all rounds.

Self-rated health status

Mothers were asked to rate their health at every round of the MEPS by responding to the question "In general, would you say that your health is excellent, very good, good, fair, or poor?" A dichotomous variable was used in the statistical analyses, comparing mothers reporting fair or poor health in any round to mothers reporting excellent, very good, or good health in all rounds.

Other mental health and chronic medical conditions

Other mental health and chronic medical conditions were identified using truncated three-digit ICD-9 codes generated from the respondent interview, where mothers were asked if they had experienced any chronic medical conditions (cancer, diabetes, chronic bronchitis, emphysema or chronic obstructive pulmonary disease, high cholesterol, HIV/AIDS, primary hypertensive disease, ischemic heart disease, stroke, arthritis, asthma, gall bladder disease, stomach ulcers, or back problems of any kind) or other mental health problems (alcohol or drug abuse, psychotic conditions, anxiety conditions, adjustment disorders or short-term reactions to stress, or personality disorders). A dichotomous

variable was constructed to identify mothers with complications of pregnancy, childbirth, and the puerperium period.

Functional limitation status

Mothers were classified as having a functional limitation if they reported limitations (because of an impairment or a physical or mental health problem) in any one of the following categories: (1) work, (2) housework, (3) school, (4) social activities, or (5) cognitive abilities. A count of functional limitations was created based on how many of the five individual limitations each mother reported, categorized as zero limitations, one limitation, and two to five limitations.

Outcome variable

Treatment of maternal depression

Treatment of maternal depression was defined using annualized information about mothers' prescription medications and psychotherapy. The MEPS Prescription Medication File was used to identify whether mothers had received prescriptions for medications indicated for the treatment of depression, as set forth by the National Committee for Quality Assurance, Health Plan Employer Data, and Information Set list of National Drug Codes for antidepressant medication management.[22] The MEPS Outpatient Department Visits File and MEPS Office-Based Medical Provider Visits File were used to determine if mothers had any visits involving psychotherapy. It was assumed that prescriptions were for a minimum of 30 days, and psychotherapy visits were for a minimum of 30 minutes.

These two types of treatment, pharmacotherapy and psychotherapy, were used to construct an index of the level of "adequacy" of the type and duration of treatment based on evidence-based treatment guidelines.[18, 23] Three mutually exclusive categories were defined: (1) no treatment, (2) some treatment, and (3) adequate treatment for depression. Mothers with depression who reported no pharmacotherapy or psychotherapy over the course of the year were categorized as receiving "no treatment." Mothers who reported any use of the identified medications or who reported using outpatient or office-based services as such were considered to have received "some treatment" for depression over the year. "Adequate treatment" was defined as receipt of either: (1) at least four anti-depression-related prescriptions or (2) at least eight outpatient or office-based psychotherapy or counseling visits. This definition has been operationalized in a similar fashion in other studies.[16, 17, 24, 25]

Analytic approach

SAS 9.2 (SAS Institute Inc, Cary, NC, USA) was used to construct the analytic files and STATA 10.1 (StataCorp LP, College Station, TX, USA) was used to perform all analyses, accounting for the complex design of the MEPS. The standard errors were corrected due to clustering within strata and the primary sampling unit. Survey weights were applied to produce estimates that account for the complex survey design, unequal probabilities of selection, and survey non-response.

Descriptive analysis

Chi-squared analyses were used to test for differences in sociodemographic and health characteristics by maternal depression treatment status. If differences were found in the overall chi-square tests, each subgroup was tested for statistical significance.

Multivariate analysis

For the regression analysis, a model was fit to identify the factors that were associated with the adequacy of treatment of maternal depression. One polychotomous logistic regression model was used to examine the odds of receiving adequate treatment or some treatment, as compared with no treatment. All variables were entered into the model simultaneously.

The Wald test was used to test the significance of four interactions between mothers' participation in the paid workforce and (a) health insurance status, (b) poverty threshold level, and (c) educational level. In addition, the interaction between race/ethnicity and health insurance status was tested.

Results

Overall, 9.5% of mothers in the USA reported depression. Among mothers with depression, 37.9% did not receive any treatment, 27.3% received some treatment, and 34.8% received adequate treatment for depression over the course of the year.

Significant differences were found in treatment status by sociodemographic and health characteristics (Table 1). Compared with mothers not receiving adequate treatment for depression, adequately treated mothers were more likely to be 35 years or older, white (non-Hispanic), or have completed some college or beyond. They were also less likely to be in the paid workforce and more likely to be living in a two-parent household or living at 400% or above the poverty threshold. Among those who reported having private health insurance, significantly more mothers received adequate care than no care. Mothers with depression were more likely to receive adequate treatment if they reported comorbid mental health problems, functional limitations, or poor perceived mental health status.

Table 1 Characteristics of mothers with depression with children ages 0–17 years by maternal depression treatment status, 1996–2005 Medical Expenditure Panel Survey

	Total	Maternal depression treatment status			
		Did not receive treatment	Received some treatment[a]	Received adequate treatment[b]	
Unweighted *N* (in mothers)	2,130	876	591	663	
Weighted *N* (in mothers)	1,882,735	713,850	514,290	654,594	
%	NA	37.9	27.3	34.8	
		Percent distribution (%)			
Predisposing factors					
Maternal age					
14–34***		45.8	41.0	30.2	**
35–44***		38.3	42.6	49.0	
45+***		15.9	16.4	20.8	
Maternal race/ethnicity					
White (Non-Hispanic)***		56.8	67.6	79.1	**
Black (Non-Hispanic)***		10.2	5.4	4.3	
Other (Non-Hispanic)***		17.1	15.4	9.4	
Hispanic***		16.0	11.6	7.1	
Age of youngest child					
0 to 1***		11.5	15.1	9.8	*
2 to 4***		22.0	17.0	16.6	
5 to 12		44.4	41.3	42.9	
13+***		22.1	26.6	30.7	
Maternal education status					
No or some high school***		26.1	19.5	13.2	**
High school graduate		32.3	33.1	28.2	
Some college***		22.4	26.8	29.8	
College or beyond***		19.2	20.6	28.8	
Maternal employment status					
Not in the paid workforce		20.1	26.1	31.3	**
Single-parent status					
Single parent		44.0	37.8	34.5	*
Family size					
Family size 4 or less		75.6	75.4	78.3	NS

Region of USA					
Northeast***		11.0	18.5	21.9	**
Midwest		25.2	23.3	26.6	
South		36.0	34.6	33.0	
West***		27.7	23.6	18.5	
MSA status					
MSA		81.5	81.9	80.9	NS
Enabling factors					
Health insurance status					
Public		21.7	20.4	21.6	**
Private***		58.6	70.6	72.9	
None***		19.7	9.0	5.4	
Ratio of family income to poverty threshold					
Below 100% (poor)***		24.8	19.7	18.7	**
100–199% (near poor/low)***		26.5	20.8	19.9	
200–399% (middle)		29.2	33.0	29.2	
400%+ (high)***		19.5	26.5	32.3	
Need factors					
Comorbidity status					
Selected mental health conditions		18.0	23.2	25.5	*
Alcohol/drug abuse		1.1	1.7	1.9	NS
Psychotic conditions		0.1	0.6	1.3	*
Anxiety conditions		10.5	17.6	18.1	**
Adjustment disorders or short-term reactions to stress		8.2	5.6	8.0	NS
Personality disorders		0.0	0.2	0.1	[c]
Other mental health conditions (NEC)		1.7	1.9	2.9	NS
Chronic medical conditions		34.7	40.5	45.2	*
Complications of pregnancy, childbirth, and the puerperium period		4.5	5.2	4.1	NS
Any mental health		19.1	24.3	27.6	*
Functional limitation status					
Work, home, or school functional limitation		10.6	18.2	27.7	**
Work functional limitation		9.9	16.3	27.1	**
Home functional limitation		6.9	12.9	18.9	**
School functional limitation		3.1	6.6	10.7	**
Social functional limitation		6.0	11.1	16.8	**

Cognitive functional limitation		8.8	14.2	20.2	**
0 out of 5 functional limitations***		84.2	74.5	65.7	**
1 out of 5 functional limitations		7.1	9.3	9.5	
2 or more***		8.7	16.2	24.8	
Health and mental health status					
Fair/poor health status		37.2	36.0	44.7	*
Fair/poor mental health status		38.1	43.7	50.3	*

NA not applicable, NS not significant

*p < 0.05; **p < 0.0001; ***p < 0.05 for this category of characteristics

[a]Received some (but less than adequate) treatment

[b]Received at least four prescriptions for antidepressants and/or eight office-based or outpatient psychotherapy or counseling visits

[c]Sample size too small

A multinomial logistic regression model was used to examine characteristics associated with mothers' receipt of some treatment or adequate treatment in reference to mothers who did not receive treatment (Table 2). The multivariate results are presented using the behavioral model as a framework.

Table 2 Odds of receiving treatment among mothers with depression in the USA, 1996–2005 Medical Expenditure Panel Survey

Independent variables	Dependent variable (ref. = did not receive treatment)	
	Received some treatment[a]	Received adequate treatment[b]
	OR 95% CI	OR 95% CI
Predisposing factors		
Maternal age (ref. = 14–34)		
35–44	1.09 [0.77, 1.54]	1.52* [1.10, 2.08]
45+	0.81 [0.48, 1.38]	1.10 [0.68, 1.79]
Maternal race/ethnicity (ref. = white (non-Hispanic))		
Black (non-Hispanic)	0.40* [0.24, 0.65]	0.21* [0.13, 0.36]
Other (non-Hispanic)	0.67* [0.47, 0.95]	0.29* [0.20, 0.44]
Hispanic	0.71 [0.48, 1.05]	0.40* [0.26, 0.60]
Age of youngest child (ref. = 13+)		
0 to 1	1.09 [0.65, 1.83]	0.71 [0.42, 1.21]
2 to 4	0.64 [0.40, 1.03]	0.69 [0.44, 1.08]
5 to 12	0.76 [0.54, 1.07]	0.73* [0.53, 0.99]
Maternal education status (ref. = no or some high school)		

High school graduate	1.20 [0.83, 1.75]	1.55* [1.04, 2.32]
Some college	1.40 [0.94, 2.08]	2.66* [1.77, 4.00]
College or beyond	1.09 [0.71, 1.67]	2.79* [1.65, 4.73]
Maternal employment status		
Not in the paid workforce	1.53* [1.12, 2.10]	1.86* [1.35, 2.56]
Single-parent status		
Single parent	1.00 [0.73, 1.38]	0.90 [0.66, 1.22]
Family size		
Family size 4 or less	0.83 [0.62, 1.12]	0.91 [0.66, 1.25]
Region of USA (ref. = West)		
Northeast	1.86* [1.20, 2.88]	2.60* [1.68, 4.03]
Midwest	1.06 [0.73, 1.54]	1.50* [1.06, 2.10]
South	1.20 [0.85, 1.69]	1.46* [1.06, 2.01]
MSA status (ref. = non-MSA)		
MSA	1.05 [0.76, 1.45]	0.99 [0.73, 1.34]
Enabling factors		
Health insurance status (ref. = none)		
Public	1.92* [1.17, 3.14]	3.73* [2.17, 6.41]
Private	2.21* [1.44, 3.38]	3.31* [2.01, 5.44]
Ratio of family income to poverty threshold (ref. = below 100%)		
100–199% (near poor/low)	1.02 [0.68, 1.52]	1.09 [0.74, 1.59]
200–399% (middle)	1.23 [0.79, 1.91]	1.03 [0.64, 1.67]
400%+ (high)	1.57 [0.93, 2.63]	1.62 [0.97, 2.72]
Need factors		
Comorbidity status		
Other selected mental health conditions	1.43* [1.06, 1.91]	1.53* [1.14, 2.07]
Chronic medical conditions	1.21 [0.92, 1.59]	1.27 [0.94, 1.71]
Functional limitation status (ref. = 0 out of 5 functional limitations)		
1 out of 5 functional limitations	1.43 [0.86, 2.38]	1.55 [0.97, 2.49]
2 to 5 out of 5 functional limitations	2.02* [1.34, 3.05]	3.01* [1.97, 4.58]
Health and mental health status		
Fair/poor health status	0.77 [0.57, 1.03]	1.00 [0.72, 1.40]
Fair/poor mental health status	1.31 [0.98, 1.74]	1.70* [1.26, 2.30]

*$p < 0.05$

[a]Received some treatment (but less than adequate) treatment

[b]Received at least four prescriptions for antidepressants and/or eight office-based or outpatient psychotherapy or counseling visits

Predisposing factors

Results indicate that black (non-Hispanic) and other (non-Hispanic) mothers were less likely to receive some treatment (60% and 33%, respectively) compared with their white (non-Hispanic) counterparts. In addition, black (non-Hispanic) mothers were nearly 80% less likely to receive adequate treatment than their white (non-Hispanic) counterparts. Hispanic and other minority mothers were less likely to receive adequate treatment as well. Compared with mothers who did not complete high school, mothers who were high school graduates were significantly more likely to receive adequate treatment. Mothers with some college education were more than twice as likely to receive adequate treatment as non-high school graduates, and mothers who completed college or additional schooling were nearly three times as likely to receive adequate care. Mothers who were not in the paid workforce were about 1.5 times more likely to receive some treatment and almost twice as likely to receive adequate treatment as those in the paid workforce. Mothers in the Northeast, Midwest, and South were all more likely to receive adequate treatment than those in the Western region of the USA.

Enabling factors

Mothers with either private or public health insurance were approximately twice as likely to receive some treatment compared to those without insurance. Compared to uninsured mothers, these mothers were over three times more likely to receive adequate treatment. The poverty threshold was not significantly associated with access to treatment.

Need factors

Mothers who had comorbid mental health conditions were more likely to receive some or adequate treatment than those without another mental health condition. Mothers with depression who had multiple functional limitations were about twice as likely to receive some care and about three times more likely to receive adequate care than mothers with no or one functional limitation. Mothers with poor perceived mental health were more likely to receive adequate treatment, but no more likely to receive some treatment.

In the final analysis, interactions between mothers' participation in the paid workforce and (a) health insurance status, (b) poverty threshold level, and (c) education level were assessed. This was done in order to determine if these covariates modified the relationship between workforce participation and receipt of adequate treatment. In addition, the interaction between race/ethnicity and health insurance status was tested in order to examine if health insurance modified the relationship between race/ethnicity and receipt of adequate treatment. None of these interactions were statistically significant.

Discussion

This national study of access to outpatient treatment for maternal depression contributes important new findings to the literature. While this study found that most mothers with depression in the USA received some form of treatment for depression, more than 65% of mothers who reported being depressed did not receive adequate treatment for their disease. Notably, this study shows that significant employment, racial, ethnic, educational, insurance-related, and geographic disparities exist in the receipt of adequate treatment for maternal depression.

First, mothers in the paid workforce were less likely to receive treatment. While previous studies have also reported an association between being employed and lower mental health care use,[26,27] this study clarifies that mothers in the paid workforce were less likely to receive both any and adequate treatment. Long work hours limit employees' ability to interact with the health care system,[28] and women specifically report that they delay or go without health care because they are unable to take time off work or have child care problems.[29] Although employer-sponsored counseling services such as Employee Assistance Programs (EAP) are effective, widely available depression treatment strategies,[30,31] they tend to be underutilized due to employee unawareness or confidentiality concerns.[32,33] In addition, EAPs differ dramatically in the services they offer[34] and primarily provide short-term counseling and/or referrals for additional care.[35] Standardization and positive promotion of EAP benefits may improve depression intervention for working mothers who lack the time or resources to access mental health care from another source.

Additionally, this study found that black (non-Hispanic) and other (non-Hispanic) mothers were less likely to get any treatment, and all minority mothers were less likely to get adequate treatment than white (non-Hispanic) mothers. While the differences found in this study may be due to racial bias, evidence for this in mental health care is conflicting. Research shows that provider bias occurs in the medical setting,[36,37] and while it is plausible that these findings may extend to the mental health care setting, one study found that provider bias did not have an effect on diagnosis and management of late-life depression.[38] Treatment initiation and patient–provider communication may also influence receipt of adequate care by minorities.[16,39] Studies show that there are ethnic and racial differences in help-seeking behavior, the use of informal support networks, and treatment preferences among women and mothers.[40–45] In order to better understand the disparity seen in the adequacy of depression treatment between white and minority mothers, it will be important to focus on barriers to treatment initiation and the possible role of racial bias and patient–provider communication.

Consistent with previous studies,[46–48] these results indicate that mothers with a higher level of education, worse self-reported mental health, or comorbid mental health conditions were more likely to receive treatment. While the relationship between education and the likelihood of some treatment was not significant, a trend between increasing education and the receipt of adequate treatment was observed. More highly educated mothers may be more health literate and have increased knowledge about the diagnosis of depression and the importance of adequate treatment. They may also be better equipped with the knowledge and skills necessary to interact with the health care system. Mothers with depression and low educational attainment are a subgroup at risk for not receiving adequate treatment and may benefit from interventions to improve their health literacy.

Mothers with either public or private insurance were more likely to get some treatment or adequate treatment as compared with their uninsured counterparts. Although these findings suggest the importance of insurance coverage in the receipt of some and adequate mental health treatment for mothers, the generosity of mental health care benefits could not be explored. Other national studies have also found that private and public health insurance increase use of mental health services,[46] yet in this study more than 80% of mothers who did not receive any treatment reported having insurance. This finding demonstrates that having health insurance does not automatically ensure the receipt of high-quality care. Key points of vulnerability in the health care system at which the gap between access

to insurance coverage and delivery of high-quality health services can widen have been identified.[49] Future research is needed to examine these points of vulnerability and other barriers to receiving treatment among mothers with insurance.

Finally, important differences were found in the receipt of adequate treatment for maternal depression by geographic region of the USA. Consistent with previous studies of regional variation in receipt of general health care,[50] mothers residing in the West were significantly less likely to receive adequate treatment for depression than mothers residing in all other regions. Regional variation in the receipt of adequate care may reflect patient preferences, provider bias, or disparities in access to primary care, which is the source of treatment for at least 30% of people with depression.[51, 52] Alternatively, regional variation could reflect differences in practice patterns, medical culture, or available technology. While no known study specifically demonstrates this, such differences have been previously observed with other primary care services.[50] Addressing the causes of regional variation in receiving adequate treatment for maternal depression is an important objective for researchers and policy makers alike.

Mothers' under- and untreated depression could adversely impact the health and well-being of their family members, particularly children. Numerous clinical studies consistently have shown that parental clinical depression is associated with children's psychiatric and other morbidity,[4, 5, 53–57] poor health status and development,[58–60] worse prevention practices for children (i.e., not using a car seat),[61, 62] and increased use and costs of pediatric health and mental health care.[59, 60, 63, 64] Moreover, similar findings have been reported on the impact of poor mental health on spouses and other family members.[65, 66]

This study has several limitations. First, the measure of treatment adequacy was based on American Psychiatric Association (APA) guidelines and captured only the use of treatment. Therefore the quality of or adherence to prescribed treatment plans could not be assessed. Moreover, the type and duration of each psychotherapy or mental health counseling session could not be assessed in this study, which limits the ability to determine the quality of the treatment. Additionally, depression treatment measurements were annualized, and therefore these analyses could not examine the length of treatment time. Second, mothers with depression were identified through household informant reports instead of clinical diagnoses, and therefore these results may not be generalizable to diagnosed patients. Finally, specific information about depression severity could not be measured in this analysis. However, general measures of functional status, comorbid mental health, and chronic medical conditions were included to address this issue.

This study has important strengths. First, the results are based on national, population-based data, providing policy makers and practitioners with a picture of the groups of mothers who are not receiving adequate treatment for their depression. Additionally, due to the large sample size and rich dataset that 10 years of the MEPS provided, several key predictors of depression treatment could be investigated together in one model, allowing for adjusted estimates of the contributing effect of each characteristic.

Conclusions

In conclusion, this study extends previous clinical and population-based research on access to treatment for maternal depression by examining access to adequate depression care in a national representative population-based sample of mothers. The findings show that most mothers with depression do not receive adequate treatment for their condition, underscoring the importance of examining adequate versus any care. For these mothers, having health insurance facilitates access to treatment. This study clarifies that employment, racial, ethnic, educational, and geographic disparities exist in the receipt of adequate treatment for maternal depression. Understanding these barriers to treatment is critical to designing effective interventions, reducing inequities, and ultimately improving the long-term mental health and health of mothers and their families. Future research studies are needed to establish if the differences in the type and duration of treatment among mothers with depression are due to patient preferences or provider and systematic biases. More specifically studies are needed to determine if these differences are avoidable, unfair, and unjust.

Implications for Behavioral Health

The study's main findings have important policy, clinical, and long-term behavioral health implications for mothers with depression. Ensuring that these mothers have insurance coverage for mental health services is important for obtaining adequate depression care. Additionally, employers may want to expand EAP programs to help both with the identification and treatment of maternal depression. The workplace may be a particularly effective target for interventions focusing on providing adequate mental health treatment to mothers in the paid workforce. Employers are poised to provide these services and stand to benefit from the improved mental health of their workforce due to increased productivity and decreased absenteeism.[67] Moreover, mothers and their providers may need to be better informed about symptoms of depression, treatment regimens, and long-term consequences of undertreating or not treating maternal depression. Overall, strategies to address disparities in the receipt of adequate depression care must be an integral component of maternal depression interventions in order to improve the long-term mental health and health of mothers and their families.

This study also has important implications for behavioral health research. This national representative study of mothers with depression augments the current literature by demonstrating that most mothers with depression do not receive *adequate* treatment for their condition even though many mothers receive at least some treatment. Future studies should consider the adequacy of treatment rather than simply whether any treatment has been received. Moreover, future work will need to specifically explore the role of benefit plan design in the timely receipt of adequate care, as the generosity of insurance coverage is likely to influence access to these services.

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