Florida Medicaid Children's Receipt of First-Line Psychosocial Care Prior to Antipsychotic Initiation

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ABSTRACT

BACKGROUND AND OBJECTIVE: First-line, nonpharmacological therapy is recommended for many pediatric mental health (MH) conditions prior to initiating antipsychotic prescription therapies. Many children do not receive these recommended services, despite the known association between antipsychotic medications and metabolic dysfunction. The main objective of this study was to quantify the association among children's MH diagnosis categories, sociodemographic characteristics and receipt of first-line psychosocial care among children in Florida Medicaid

METHODS: Florida Medicaid enrollment, healthcare and pharmacy claims were used for this multivariate analysis. Children were assigned to condition clusters wherein related diagnoses were grouped into clinically relevant categories. A total of 7704 children were included in the final analysis.

RESULTS: Twenty-four percent of children in Florida Medicaid do not receive first-line, nonpharmacological psychosocial care. Age was significantly associated with not receiving

psychosocial services, with older children less likely to receive. Non-Hispanic White children as well as those living in rural areas had lower odds of receiving behavioral intervention prior to initiating antipsychotics. Children with mood-disorders, behavior problems, anxiety and stress related disorders were more likely to receive first-line psychosocial care.

CONCLUSIONS: This study provides an important understanding of the variability in receipt of first-line psychosocial care before antipsychotic medication initiation among children in Medicaid based on sociodemographic and MH health characteristics. These analyses can be used to develop quality improvement initiatives targeted toward children that are most vulnerable for not receiving recommended care.

KEYWORDS: antipsychotic use; psychosocial care; race-ethnicity; rurality; social vulnerability

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WHAT'S NEW

There is variability in receipt of first-line psychosocial care before antipsychotic medication initiation among children in Medicaid based on sociodemographic and mental health characteristics. These analyses can be used to develop targeted quality improvement initiatives for these vulnerable children.

WITH PROLONGED EXPOSURE, antipsychotics are associated with a range of adverse metabolic effects including obesity, diabetes and cardiovascular disease.[1] Further, interventions to address antipsychotic medication-associated weight gain and metabolic disorders in children are not well-developed or used,[2] potentially contributing to poor health into adulthood. The Food and Drug Administration approved antipsychotic use for children with specific psychiatric disorders including schizophrenia, bipolar disorder, autism and Tourette's. However the use of antipsychotics, in practice, extends beyond those

conditions and is used off-label for pediatric mental health (MH) conditions such as attention deficit hyperactivity disorder, conduct disorders and depression.

Behavioral therapy is an important nonpharmacologic intervention for these conditions as well as for anxiety, autism and intellectual and developmental disabilities.[3−5] It is a critical intervention, given the significant side effects associated with antipsychotic medication. Yet, nationally, almost 40 percent of children, regardless of insurance type do not receive this care.[6,7] Further, off-label use of antipsychotics in children and adolescents frequently occurs, including for those conditions where nonpharmacological treatment is indicated.[8,9] Children receiving Medicaid, especially those in foster care, are at particular risk for not receiving first-line psychosocial care.[10] Children with MH conditions disproportionately receive care through Medicaid making this an important population to focus on when assessing receipt of recommended care related to antipsychotics.[11] Further, overall, 1% to 2% of children in Medicaid are taking antipsychotics with the highest use observed

among those in foster care, ranging from 5% to 16%, depending on the state. This is compared to less than 1% of commercially insured children taking antipsychotics.[12]

Despite the importance of receiving first-line, nonpharmacological, psychosocial care, before initiating antipsychotics, little is known about the health and sociodemographic characteristics of children who do and do not receive such care. The "Safe and Judicious Use of Antipsychotics in Children and Adolescents" measure set, which includes a measure on receipt of first-line psychosocial care was developed through the Pediatric Quality Measures Program (PQMP)[13] and the National Collaborative for Innovation in Quality Measurement. Leveraging this measure we can begin to better understand which children are at greatest risk for not receiving evidence-based care. This information, in turn, can form an important foundation for the development of multilevel quality improvement (QI) activities targeting Medicaid Managed Care Plans, primary care providers and parents[14] to increase awareness of and a focus on first-line psychosocial care. Further, these analyses may yield important information about disparities in access to care based on rurality, race or ethnicity and social vulnerability.[15]

Our primary aim is to address this gap in knowledge by quantifying the association among children's MH diagnosis categories, sociodemographic characteristics and receipt of first-line psychosocial care among children in Florida Medicaid. Over 7000 children were identified for inclusion in the analysis using components of the National Committee on Quality Assurance Healthcare Effectiveness Data and Information Set (HEDIS) technical specifications for "Use of First-Line Psychosocial Care for Children and Adolescents on Antipsychotics," which is one measure with the "Safe and Judicious Use of Antipsychotics in Children and Adolescents" developed, in part through the PQMP.[6]

METHODS

DATA SOURCES

Child-level Medicaid enrollment and health care and pharmacy claims data for 2019 were used in a multivariable analysis because these were the most recent Florida Medicaid data available. The enrollment files contain information about the child's date of birth, sex, race and/or ethnicity and place of residence. The health care and pharmacy claims contain child-level International Classification of Diseases, 10th Revision (ICD), Current Procedural Terminology, Healthcare Common Procedure Coding System, and National Drug Codes. A data use agreement between the University of Florida and Florida Medicaid allows for use of the data for research purposes. The University of Florida Institutional Review Board approved this retrospective study and granted a waiver of informed consent.

STUDY DESIGN AND SELECTION CRITERIA

This is a cross-sectional analysis of health care claims data from Florida Medicaid in 2019. We used components of the 2019 HEDIS specifications for "Use of First-Line Psychosocial Care for Children and Adolescents on Antipsychotics" to guide our sample identification.[16] We identified children in Florida Medicaid aged 1 to 17 years who had a new prescription for antipsychotic medication in 2019. The antipsychotic prescriptions were identified using National Drug Codes. We chose an index date for each patient as the earliest antipsychotic prescription dispensing date. We looked back 4 months prior to the index date to confirm a negative antipsychotic history, as required in the HEDIS technical specifications. The participants had to have continuous enrollment 4 months before and one month after the index date to be included in the analysis. We also used the HEDIS technical specifications for the codes used to identify first-line psychosocial care.

We deviated from the HEDIS technical specifications by including all of the MH diagnosis categories. The HEDIS specifications exclude children with at least one acute inpatient encounter with a diagnosis of schizophrenia, schizoaffective disorder, bipolar disorder, other psychotic disorder, autism or other developmental disorder during the measurement year. We included all children in the MH diagnosis categories who received antipsychotics to ascertain receipt of first-line psychosocial care, which is critical for quality of care.

OUTCOME VARIABLE

The outcome is a binary variable whether the child received first-line psychosocial care. The psychosocial care procedures were identified using Current Procedural Terminology and Healthcare Common Procedure Coding System codes, as specified in the HEDIS technical specifications, during a 4-month period from 3 months before the index date to one month after the index date.

PREDICTOR VARIABLES

The children's MH conditions were our primary variable of interest. There are 328 unique ICD-10-CM and 1956 Systematized Nomenclature of Medicine (SNOMED CT) codes for MH conditions observed among children. Organizing these diagnostic codes into parsimonious and clinically meaningful groups (ie, a typology) was done to facilitate analysis and reporting. We developed the condition clusters (ie, sets of diagnostic codes that assessed a single clinical category) through a consensus process with 4 child psychiatry experts and 2 pediatric clinical informatics experts. The consensus process generated 31 clusters using both the ICD and SNOMED terminologies (Table 1). The typology includes 8 categories, and each category contains 3 to 5 clusters of MH diagnoses. For the child to be categorized, they had to have an ICD or SNOMED code associated with one inpatient or 2 outpatient encounters using E & M codes for physician visits. A child could have multiple MH conditions.

The sociodemographic variables are age, sex, race-ethnicity, rurality of residence, and social vulnerability index (SVI). Race-ethnicity was grouped as non-Hispanic (NH)-White, NH-Black, Hispanics, NH-Other, and Unknown.

Table 1. Mental Health Condition Hierarchy

Mental Health Category	Cluster of Diagnoses
Substance use	Drug abuse
	Opioid dependence
	Alcoholism
Nonmood psychiatric disorders	Schizoaffective disorder
	Schizophrenia
	Psychotic disorder
	Delirium
Mood disorders	Depressive disorder
	Major depressive disorder
	Bipolar disorders
	Suicide attempt/suicide ideation
	Disruptive mood dysregulation disorder
Anxiety and stress-related disorders	Anxiety disorder
	OCD (Tics, body dysmorphia, trichotillomania)
	Post-traumatic stress disorder (Family disruption, parent-child problems, child abuse and neglect)
	Somatic atymproma and related disorders
	Sexual dysfunction/Gender dysphoria
Behavioral syndromes	Eating disorders
	Sleep-Wake disorders
	Catatonia
ADHD, personality and impulse-control disorders	Personality disorders
	Impulse control (pyromania, paraphilia, kleptomania)
	ADHD
Developmental disorders	Intellectual developmental disorder
	Developmental academic disorder
	Autism spectrum disorder
Childhood behavior problems	Conduct disorders
	Oppositional defiant disorders
	Intermittent urinary incontinence
	Encopresis
	Reactive attachment disorder

ADHD indicates attention deficit hyperactivity disorder.

We also incorporated measures of rurality and social vulnerability to better understand the effects of the children's place of residence on receipt of recommended care. Rurality was determined by aggregating Rural-Urban Continuum Codes created by Economic Research Services at the US Department of Agriculture, with 1 as urban, 2 to 3 as metro, and 4 to 9 as rural area.[17] We calculated the SVI, which is a composite measure of census tract social vulnerability where census tracts are ranked using 15 social factors grouped into 4 domains: socioeconomic status, household composition, race-ethnicity-language, and housing-transportation.[18] Each census tract receives a ranking for each domain as well as an overall SVI ranking. These rankings allow researchers, public health entities and policymakers to identify areas that have high, moderate, and low levels of susceptibility to external stressors that are known to have negative effects on communities' health.

STATISTICAL ANALYSES

All analyses were performed in SAS Version 9.4 (SAS Institute, Cary, NC). We computed descriptive statistics by the condition clusters and categories in the typology. We built a logistic regression model that used the outcome of whether the patient received first-line psychosocial care (yes/no). Predictor variables included age at index date, sex, race-ethnicity, rurality of residence, SVI, and the typology categories. Two of the typology categories were dropped from the analyses due to small numbers or no children in those categories—Substance Use Disorders and Behavioral Syndromes. The remaining 6 typology categories were included in the analysis.

We considered up to 2-way interactions between typology categories with other predictors as the full model. We checked collinearity and removed the 2-way interactions due to collinearity. Odds ratios (ORs) with 95% confidence intervals (CIs) and the P value of all the predictors for added-in-order tests from the logistic regression model were reported. The area under the receiver operating characteristic curve was also reported to assess the model performance.[19] A P value $\leq.05$ is considered statistically significant.

RESULTS

Figure illustrates the participant selection process. We identified 11,671 children aged 1 to 17 years enrolled in Florida Medicaid who had a new prescription for antipsychotics in 2019. We excluded 885 children who did not have continuous enrollment 4 months prior and one month after the index date, and further excluded 3082 children who had no MH diagnosis or had only one outpatient encounter with the MH diagnosis in the typology. We included 7704 children in the final analysis.

The study cohort was 42.9% female with a median age of 13.1 and an interquartile range of 10.1 to 15.2 (Table 2). The cohort was diverse, with 33.7% non-Hispanic (NH)-White, 15.5% NH-Black, 18.7% Hispanics. About 26% of the children had unknown race and ethnicity. Over one third of the children (37.7%) lived in the highest or most socially vulnerable SVI quartile. Children could be assigned to more than one typology category. Approximately 50% of children had one MH diagnosis and the remainder had 2 or more diagnoses and therefore might be represented in more than one category. Almost 60% of children were categorized with mood disorders followed by personality and impulse control disorders (35.1%) and childhood behavior problems (30.3%). Notably, 76.1% of the children overall received first-line psychosocial care ranging from 73.8% of children with nonmood disorders to 80.9% of children with behavioral syndromes and 80.9% for childhood behavioral disorders.

Table 3 reports the odds ratios of all the MH categories and the covariates in the logistic regression model. The interaction terms were not significant and therefore removed from the model. The area under the receiver operating characteristic curve of the final model was 0.610, indicating an adequate model fit. In terms of sociodemographic variables, age, race-ethnicity and rurality were significantly associated with the likelihood of getting first-line psychosocial care. With every one year increase
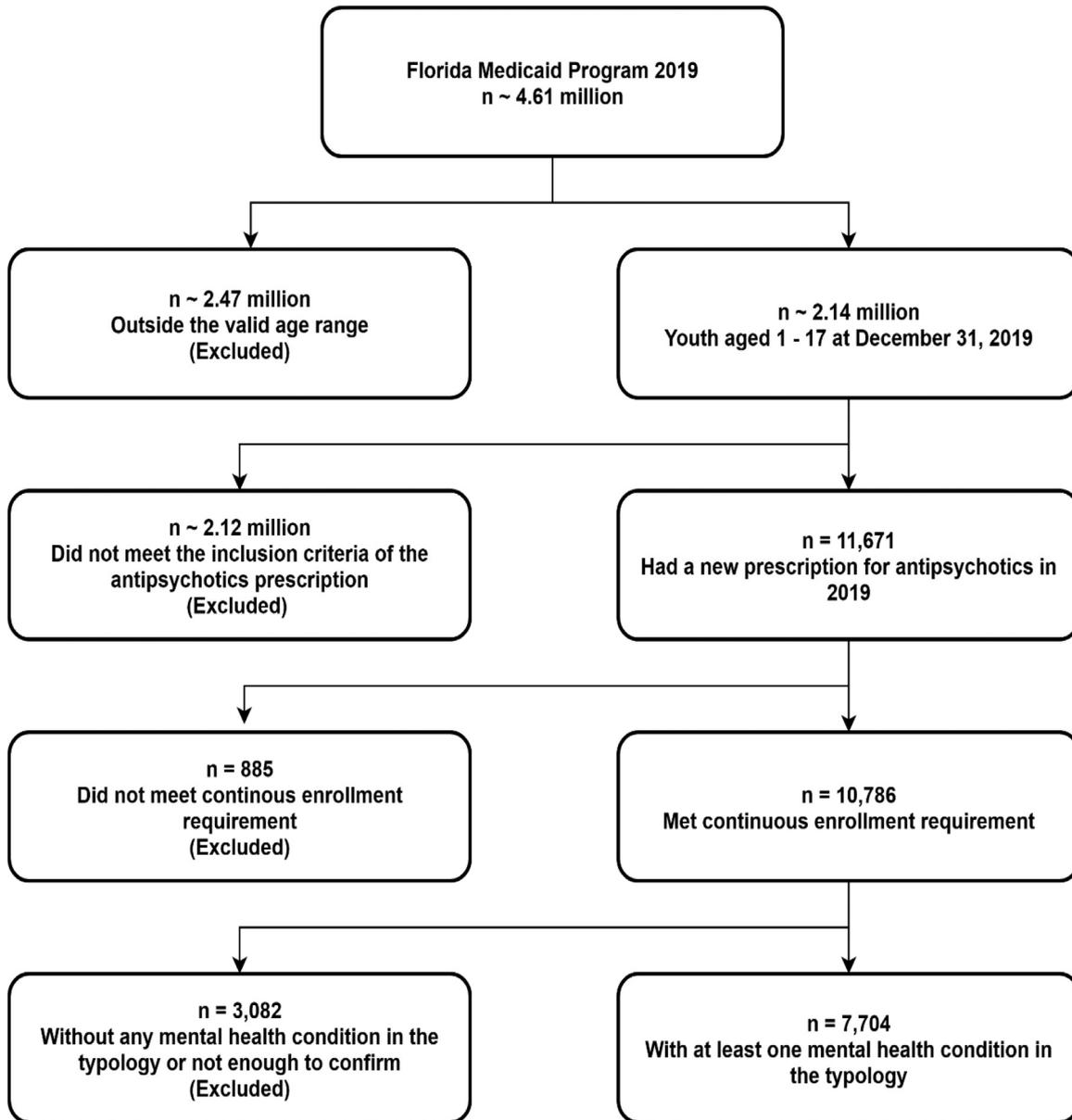
Figure. *Flow chart of identifying the Study Cohort from Florida Medicaid in 2019.*

in age, there was about 4% lower odds of getting psychosocial care (OR: 0.962, 95% CI: 0.956−0.977). Hispanics and NH-Others had higher odds (OR: 1.587, 95% CI: 1.351−1.863; OR: 1.316, 95% CI: 1.030−1.681, respectively) of getting psychosocial care than NH-Whites. Children living in rural areas had lower odds of receiving first-line psychosocial care compared to children living in urban areas (OR: 0.456, 95% CI: 0.353−0.590). Children who had mood disorders, child behavior problems or anxiety and stress-related disorders were more likely to receive first-line psychosocial care prior to antipsychotic prescription than children without those MH conditions, with odds ratios of 1.47, 1.57, and 1.37, respectively and *P* values <.0001.

DISCUSSION

The Florida Medicaid Program performs better than the national Medicaid rates for receipt of first-line

psychosocial care measured relative to results reported to National Committee on Quality Assurance (76% vs 62%). Although we did not follow the HEDIS exclusion criteria, 74% to 81% of children received first-line psychosocial care, depending on the MH category, all above national rates. Despite this relatively strong performance, 24% of children in Florida Medicaid do not receive first-line psychosocial care. Our analyses provide an important analytic framework and findings for both Florida and other states to identify QI opportunities. To our knowledge, our study is the first to examine receipt of this care based on sociodemographic characteristics and MH categories. Notably, we found that Hispanic children are 58% more likely to receive first-line psychosocial care than NHW children. Other studies have identified that Hispanic children in Medicaid are significantly less likely to use antipsychotic drugs than NHW children and that these differences are not explained by the types of MH diagnoses observed

Table 2. Participant Characteristics at the Index Date

Variable	Total (n = 7704)		
Age, Median (Q1, Q3)		13.1 (10.1, 15.2)	
Female, n (%)	3304	42.9%	
Race-ethnicity	2599	33.7%	
Non-Hispanic White			
Non-Hispanic Black	1195	15.5%	
Hispanic	1441	18.7%	
Other	451	5.9%	
Unknown	2018	26.2%	
Rurality, n (%)	4149	53.9%	
Urban			
Metro	2647	34.4%	
Rural	265	3.4%	
Not assigned	643	8.3%	
Social vulnerability index quartile, n (%)			
1 (least vulnerable)	707	9.2%	
2	1443	18.7%	
3	2002	26.0%	
4 (most vulnerable)	2908	37.7%	
Not assigned	644	8.4%	
Mental health categories*, n (%)			Had first-line psychosocial care
Mood Disorders	4596	59.7%	76.9%
ADHD, personality & impulse-control disorders	2701	35.1%	76.5%
Childhood behavior problems	2338	30.3%	80.9%
Anxiety and stress-related disorders	1813	23.5%	80.4%
Developmental disorders	1152	15.0%	77.6%
Nonmood psychiatric disorders	480	6.2%	73.8%
Behavioral syndromes	28	0.4%	80.9%
Substance use	0	0%	
All categories first-line psychosocial care	5864	76.1%	

ADHD indicates attention deficit hyperactivity disorder.
*Children can be assigned to more than one category.

between the groups.[20,21] These studies also found that among children with MH conditions, MH service use was lower among Hispanic children relative to NHW children. Prior studies did not specifically examine receipt of first-line psychosocial care prior to initiation of antipsychotic medication but rather examined any MH service use, making it difficult to directly compare and contrast our findings to those of others.

Table 3. Odds Ratio for Receiving First-Line Psychosocial Care for Each Predictor from the Logistic Regression Model

Variable	Odds Ratio	95% Wald Confidence Limits		P Value
Age at index date	0.962	0.946	0.977	<.0001
Race/ethnicity (reference group non-Hispanic White)				
Non-Hispanic Black	0.874	0.749	1.019	.0854
Hispanic	1.587	1.351	1.863	<.0001
Other	1.316	1.030	1.681	.0279
Unknown	1.055	0.920	1.210	.4434
Rural/urban (reference group: urban)	0.996	0.888	1.117	.9499
Small metro				
Rural	0.456	0.353	0.590	<.0001
Social vulnerability quartiles (reference group 1st quartile, least vulnerable)	0.872	0.703	1.082	.2140
2				
3	0.935	0.760	1.150	.5234
4 (Most vulnerable)	0.954	0.779	1.168	.6452
Not assigned	0.792	0.613	1.022	.0731
Typology categories (reference group: for each category the reference is those who do not have the condition)	1.470	1.285	1.681	<.0001
Anxiety and stress-related disorders				
Childhood behavior problems	1.572	1.387	1.783	<.0001
Developmental disorders	1.166	0.986	1.378	.0731
Mood disorders	1.372	1.215	1.549	<.0001
Nonmood psychiatric disorders	0.964	0.774	1.199	.7391
ADHD, personality and impulse-control disorders	1.006	0.896	1.129	.9212

ADHD indicates attention deficit hyperactivity disorder.

Some possible reasons for our differing findings include our use of the PQMP-developed quality indicator that focuses on a specified time frame for receipt of first-line psychosocial care as opposed to examining any MH service use. More specifically, our study focused on receipt of nonpharmacologic, psychosocial care prior to the initiation of antipsychotics as opposed to any MH service use not anchored to a specific event (eg, antipsychotic drug initiation). In addition, our study was conducted using Florida Medicaid data. Florida has 5.7 million people or 26% of the population who are Hispanic, which is the third highest in the United States. Texas, California, and Florida have seen the highest increases in the Hispanic population from 2010 to 2019 compared to other states.[22] It is possible that due to the growth, large numbers and percent of Hispanic individuals, providers with the Florida Medicaid program are more attuned to the needs of Hispanic children and better able to facilitate receipt of evidence-based care.

Further, the Hispanic population in Florida is diverse and studies, including ours, often are not able to distinguish among Hispanic subgroups. While the Hispanic population in Texas and California is largely Mexican, in Florida, 41% of Hispanics are Cuban, 18% are Puerto Rican, 17% are Mexican and 13% are South American.[23] We do not have specific breakdowns in the Medicaid enrollment files, only information about whether the child is Hispanic. It is possible that the diversity of the Hispanic population in Florida further enhances the difficulty in comparing our results to those of other studies. Further, approximately 48% of Hispanics in Florida are foreign-born and 52% were born in the United States. We do not have information about where the children were born and do not know the extent to which place of birth may influence our findings.[24]

Our study also found that NHB children were 13% less likely than NHW children to receive first-line psychosocial care but these findings were marginally significant ($P = .0854$). However, these findings are similar to those of other studies. For example, one study examined antidepressant medication use among NHB children with depression and found that the children were less likely to be taking medication relative to NHW children in Medicaid.[25] Further, other studies found that NHB children have reduced MH use and delayed MH diagnoses relative to NHW children but did not specifically examine receipt of first-line psychosocial care.[26,27]

Access to care may also play an important role in receipt of first-line psychosocial care for children. Children residing in rural areas were 54% less likely to receive recommended psychosocial care relative to those living in urban areas. No significant differences in receipt of care were observed between children living in urban areas and small metro areas. Other studies examining MH use among children in rural areas often focus on children who are black. We examined the interaction of race/ethnicity and rurality in our study but it was not significant and therefore excluded from the final model. The studies examining health care use among rural black children

identify issues such as community stigma toward MH conditions, lack of health care services and mistrust of these services.[28,29]

Florida's rural counties, like others in the United States, are characterized by persistent adult and childhood poverty, defined as poverty rates of 20% or more for the past 30 years,[30] along with a lack of MH services and providers. To address this challenge, Florida's Department of Education directed funding toward MH teleservices for school-age children.[31] Telehealth services grew markedly because of the coronavirus disease 2019 pandemic and early findings indicate that telehealth has the potential to increase MH treatment availability and ongoing monitoring for children.[32,33] Further research is needed to examine the role of telehealth in providing first-line psychosocial care for children in underserved areas, including better understanding technological barriers and literacy among rural residents, the use of local resources to help prepare parents and children for a MH telehealth visit, reimbursement challenges and ensuring that telehealth psychology best practices are followed.[34,35]

Our study also provides an important understanding of the diagnostic categories for children that are most likely to receive first-line psychosocial care. Children with mood, childhood behavior, anxiety, and stress disorders were all significantly more likely to receive first-line psychosocial care than children without these conditions. This is an encouraging and positive finding because these MH typology categories include conditions that do not have Food and Drug Administration-indicated prescribing of antipsychotics such as depression.[36] However, all children should have first-line psychosocial care because this is an important component of overall treatment and because of the adverse metabolic effects that children taking antipsychotics experience. The MH typology provides a useful mechanism for grouping related diagnoses together into categories, which facilitates analyses and also opportunities to better target QI initiatives toward groups of children that are most vulnerable for not receiving recommended care.

There are limitations to our study. First, the study was conducted in Florida and the findings may not be generalizable to children in other states. However, Florida is the third largest state in the United States and along with California and Texas has a large and rapidly growing population. Thus our findings may be applicable to other large US states. Second, the interaction terms in our model were not significant. However, it is possible that the children have intersecting vulnerabilities, such as being black and residing in a rural area. This is an area for future research and perhaps pooling multiple years of data or data from other states might allow for a deeper examination of intersecting vulnerabilities such as race, rurality and social vulnerability. Third, we excluded 3081 children from the analysis because they had no MH diagnosis or only one occurrence of the diagnosis in the health care claims data (2 occurrences of the diagnosis were required for inclusion), despite having a prescription for an antipsychotic medication. It is possible that some of these

children received first-line psychosocial care but the diagnosis was not recorded or they received such care in a school health center, for example. Excluding these children may have introduced an unknown bias into the study. Finally, we did not follow all components of the HEDIS technical specifications because we wanted to examine receipt of first-line psychosocial care for all MH typology categories so comparisons cannot be directly made to national Medicaid HEDIS results.

In conclusion, our results demonstrate variability in receipt of first-line psychosocial care before antipsychotic medication initiation among children in Medicaid based on sociodemographic and MH health characteristics. Hispanic children fared better, while those in rural areas fared worse in receiving recommended care. Further, children with anxiety/stress, mood disorders and/or child behavior disorders were more likely to receive recommended care. Our findings point to opportunities to initiate novel interventions to address access to care such as telehealth services in rural communities related to first-line psychosocial care. Moreover, our findings also point to opportunities for future research to better understand strategies that are contributing to the receipt of evidence based care among Hispanic children and children with certain MH conditions. Possibly these strategies can be adapted and adopted for children of other races/ethnicities and MH conditions.

ACKNOWLEDGMENTS

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