

Mental Health Spending and Intensity of Service Use Among Individuals With Diagnoses of Eating Disorders Following Federal Parity

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Objective: The Mental Health Parity and Addiction Equity Act (MHPAEA) was intended to eliminate differences in insurance coverage for mental health and substance use disorder services and medical-surgical care. No studies have examined mental health service use after federal parity implementation among individuals with diagnoses of eating disorders, for whom financial access to care has often been limited. This study examined whether MHPAEA implementation was associated with changes in use of mental health services and spending in this population.

Methods: Using Truven Health MarketScan data from 2007 to 2012, this study examined trends in mental health spending and intensity of use of specific mental health services (inpatient days, total outpatient visits, psychotherapy visits, and medication management visits) among individuals ages 13–64 with a diagnosis of an eating disorder (N=27,594).

Results: MHPAEA implementation was associated with a small increase in total mental health spending (\$1,271.92; $p < .001$) and no change in out-of-pocket spending (\$112.99; $p = .234$) in the first year after enforcement of the parity law. The law's implementation was associated with an increased number of outpatient mental health visits among users, corresponding to an additional 5.8 visits on average during the first year ($p < .001$). This overall increase was driven by an increase in psychotherapy use of 2.9 additional visits annually among users ($p < .001$).

Conclusions: MHPAEA implementation was associated with increased intensity of outpatient mental health service use among individuals with diagnoses of eating disorders but no increase in out-of-pocket expenditures, suggesting improvements in financial protection.

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Passage of the Mental Health Parity and Addiction Equity Act (MHPAEA) in 2008 represented the culmination of decades of effort on the part of advocates to secure the enactment of a comprehensive policy to improve equity in insurance coverage for mental health and substance use disorder services compared with general medical services. Although the vast majority (98% in 2002) of workers with employer-sponsored health insurance coverage had mental health benefits before MHPAEA's implementation, special benefit limits for mental health and substance use disorder services, including higher copayments than for general medical-surgical services and special annual limits on the number of inpatient days and outpatient visits covered for mental or substance use disorders or on expenditures for these services, were common in the private insurance market (1).

Under MHPAEA and its regulations, plans that cover mental health and substance use disorder services must offer benefits for these services that are at least as generous as benefits for comparable medical-surgical services (2,3). Parity

requirements apply to both quantitative treatment limits (for example, cost sharing and annual day or visit limits) and nonquantitative limits (for example, utilization review processes, application of medical necessity criteria, and provider network management). Parity advocates hoped that MHPAEA implementation would result in greater financial access to mental health and substance use disorder services and improved financial protection for individuals with mental disorders, particularly high users who were most affected by annual spending and utilization limits. MHPAEA did not, however, require plans to cover specific mental or substance use disorder diagnoses, leaving the decision about which diagnoses to cover under federal parity to health plans (4).

The estimated lifetime prevalence of eating disorders is 3%–4% for women and 2% for men (5). Eating disorders, including anorexia nervosa, bulimia nervosa, and binge eating disorder, are associated with social and role functioning impairment and increased risk of suicidal ideation and suicide attempts (6). Many individuals with eating disorders do not

receive treatment for this condition (5,6), despite potentially life-threatening medical complications (7,8). Limited insurance coverage is one reason for not obtaining treatment. Anecdotal reports of privately insured individuals with eating disorders who were unable to obtain coverage for mental health treatment services are common (9–12). MHPAEA could expand access to such services and improve financial protection for individuals with eating disorders and their families. However, in a national survey of commercial health plans, Horgan and colleagues (13) found that 22.4% of plans did not cover services for eating disorders in 2010, the first year after the law went into effect but before enforcement efforts by the federal government began in 2011. In addition, several lawsuits brought by parties alleging violations of MHPAEA or state parity laws have involved the treatment of eating disorders (14).

Little is known about the impact of MHPAEA on mental health spending and utilization among individuals with an eating disorder. We used an interrupted time-series design and a large private insurance data set to examine whether federal parity was associated with changes in mental health spending and intensity of mental health service use among commercially insured individuals with an eating disorder.

METHODS

Data and Sample

We used the Truven Health MarketScan Database from 2007 to 2012. The MarketScan database includes health insurance claims and enrollment information for employees and their dependents from approximately 100 large employers and health plans in the United States, covering between 17 million and 22 million enrollees per year.

The study population included adolescents and adults ages 13–64 with an inpatient or outpatient claim with a primary diagnosis of an eating disorder, including anorexia nervosa, eating disorder not otherwise specified, or bulimia nervosa (*ICD-9-CM* codes 307.1, 307.50, and 307.51) anytime during the six-year study period from 2007 through 2012. We initially examined the number of individuals identified as having an eating disorder diagnosis by using only the primary diagnosis versus any diagnosis on a claim, and the sample sizes obtained from the two approaches were very similar. To ensure that we identified individuals who were receiving care specifically for an eating disorder, we opted to use the more restrictive definition that required an individual to have at least one claim with a primary diagnosis of an eating disorder. The unit of analysis was the person-month.

To be included in the cohort, an individual must have been enrolled continuously during all 12 months of the year of initial eating disorder diagnosis. Given the chronic nature of most eating disorders and the undercoding of these diagnoses, once an individual met the criteria for inclusion, the individual appeared in the study population for all subsequent calendar years in which they were enrolled for 12 months during the study period. To ensure that we had complete information on mental health service use, we omitted plans for which mental

and substance use disorder carve-out claims were unavailable in the MarketScan data.

The Affordable Care Act (ACA) provision requiring health plans to cover all young adults up to age 26 as dependents on their parents' private insurance plans was implemented in the same year that enforcement of MHPAEA began (2011). To address the potential for compositional changes in the population studied resulting from the dependent care provision's implementation, we excluded individuals who were ages 19–25 and enrolled as a dependent in either 2011 or 2012. The final analytic sample consisted of 27,594 individuals who had an eating disorder diagnosis during the study period.

To determine whether an individual had a comorbid mental or substance use disorder, we used *ICD-9-CM* diagnostic codes to group individuals by using a hierarchy of five diagnosis categories: bipolar disorder; depression; anxiety, posttraumatic stress disorder, phobia, or obsessive-compulsive disorder; other mental disorder; and substance use disorder. For example, if a participant had at least one claim with a bipolar disorder diagnosis during the study period, he or she was placed in that group, regardless of any other diagnoses; if a participant did not have a bipolar disorder diagnosis but had a depression diagnosis, he or she was placed in the depression group, and so on.

Study Outcomes

Among individuals with an eating disorder diagnosis during our study period, we focused on two types of outcomes: mental health spending and intensity of mental health service use. All outcomes were calculated at the person-month level. For spending, we examined total mental health spending (the sum of health plan and enrollee out-of-pocket spending on these services), outpatient mental health spending, inpatient mental health spending, and out-of-pocket mental health spending, which included deductibles, copayments, and coinsurance. The total spending measure included spending on inpatient and outpatient mental health services and psychiatric medications, defined by using a well-established algorithm (15–17). The costs associated with an inpatient mental health hospitalization were included if the majority of the claims associated with the stay had a primary diagnosis of a mental health condition (*ICD-9-CM* codes 295.xx–302.xx, 306.xx–309.xx, and 311.xx–314.xx) and the discharge claim had a primary diagnosis of a mental health condition, as in previous work (17,18). Spending on outpatient services was included if the claim had a primary diagnosis of a mental health condition, a mental health-specific procedure code, or a mental health-specific HCFA revenue code. As is typical, emergency department services were captured in the inpatient file if that visit resulted in a hospitalization; otherwise these services were captured in the outpatient file. All spending outcomes were adjusted for inflation by using the Personal Health Care Index (19) and are reported in 2012 dollars.

For intensity of use, outcomes focused on the number of units of specific services used in a month among the subset of individuals who used that type of service at least once during

TABLE 1. Characteristics (unadjusted) among privately insured persons with an eating disorder diagnosis in each year or in a previous year, 2007–2012^a

Characteristic	Preparity						Transition		Postparity			
	2007 (N=4,390)		2008 (N=7,651)		2009 (N=9,532)		2010 (N=11,409)		2011 (N=14,372)		2012 (N=17,101)	
	N	%	N	%	N	%	N	%	N	%	N	%
Female	3,944	89.8	6,677	87.3	8,174	85.8	9,734	85.3	12,206	84.9	14,465	84.6
Age												
13–17	521	11.9	838	11.0	916	9.6	1,184	10.4	1,915	13.3	2,929	17.1
18–24	765	17.4	997	13.0	756	7.9	265	2.3	232	1.6	236	1.4
25–34	912	20.8	1,651	21.6	2,161	22.7	2,543	22.3	2,952	20.5	3,134	18.3
35–44	1,056	24.1	1,920	25.1	2,562	26.9	3,265	28.6	4,026	28.0	4,612	27.0
45–54	878	20.0	1,655	21.6	2,283	24.0	2,950	25.9	3,622	25.2	4,237	24.8
55–64	258	5.9	590	7.7	854	9.0	1,202	10.5	1,625	11.3	1,953	11.4
Any comorbid mental disorder diagnosis ^b	1,925	43.8	3,074	40.2	3,712	38.9	4,182	36.7	5,339	37.1	6,436	37.6
Bipolar disorder	223	5.1	318	4.2	378	4.0	417	3.7	538	3.7	586	3.4
Depression	1,125	25.6	1,724	22.5	2,059	21.6	2,281	20.0	2,760	19.2	3,380	19.8
Anxiety, PTSD, phobia, or obsessive-compulsive disorder	258	5.9	485	6.3	613	6.4	729	6.4	1,041	7.2	1,304	7.6
Other disorder	319	7.3	547	7.1	662	6.9	755	6.6	1,000	7.0	1,166	6.8
Intensity of service use	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
N of inpatient days among inpatient users (N=1,516)	17.4	19.0	16.6	18.5	18.1	18.5	18.1	19.5	18.3	22.3	18.1	21.7
N of outpatient visits among outpatient users (N=36,937)	15.1	21.5	14.8	20.7	14.7	20.7	14.8	22.8	16.7	26.5	17.6	26.9
N of psychotherapy visits among psychotherapy users (N=24,000)	14.5	15.6	14.8	16.1	14.7	16.6	15.3	18.6	16.5	21.5	16.4	19.5
N of medication management visits among medication management users (N=5,879)	4.2	3.9	4.0	3.5	4.4	4.6	4.3	4.3	4.2	4.1	4.1	3.8
N of partial hospitalizations or intensive outpatient visits among users of either (N=1,831)	16.1	20.6	17.1	19.9	15.7	14.4	19.9	21.7	22.3	22.3	23.3	22.2
N of other outpatient services, excluding those above, among outpatient users (N=25,999)	3.2	7.1	3.3	6.7	3.3	6.5	3.1	6.4	3.5	8.5	3.9	8.0
Total mental health spending (in 2012 dollars)	3,829	11,080	3,499	9,986	3,242	8,707	3,006	8,607	3,306	9,904	3,475	10,973
Out-of-pocket mental health spending (in 2012 dollars)	601	1,874	588	2,103	504	948	458	815	492	913	498	936

^a Descriptive statistics are presented in person-years. Individuals are represented each year from the first year in which they were diagnosed as having an eating disorder and had 12-month continuous enrollment in the calendar year. The study sample comprised 27,594 unique individuals with an eating disorder diagnosis.

^b Individuals could have more than one comorbid mental health diagnosis.

the month. We examined the number of mental health inpatient days in the month among mental health inpatient service users. On the outpatient side, outcomes were the

number of psychotherapy visits among users, the number of medication management visits among users, and the total number of outpatient mental health visits among users.

TABLE 2. Interrupted time-series models of changes in total and out-of-pocket spending on mental health services among individuals with an eating disorder diagnosis, 2007–2012

Variable	Coefficient	SE	p	Effect through first year postparity ^a		
				Estimate	F ^b	p
Mean total mental health spending per month				1,271.92	26.35	<.001
Parity	14.58	26.18	.580			
Time	–3.85	.49	<.001			
Parity × time	4.94	1.01	<.001			
Mean out-of-pocket mental health spending per month				112.99	1.46	.234
Parity	4.71	9.72	.630			
Time	–.54	.19	.007			
Parity × time	.25	.39	.522			
Mean outpatient mental health spending per month among outpatient users				543.86	2.95	.093
Parity	–3.72	33.21	.911			
Time	–.69	.64	.286			
Parity × time	2.65	1.31	.049			
Mean inpatient mental health spending per month among inpatient users				35,589.00	5.13	.029
Parity	3,471.00	1,667.00	.043			
Time	–37.05	31.24	.242			
Parity × time	–27.31	63.87	.671			

^a Estimates (in 2012 dollars) for first year postparity reflect the effect of parity through the first year of parity enforcement (2011).

^b df=1 and 44

Statistical Approach

To assess the impact of the federal parity law on mental health spending and intensity of mental health service use for individuals with diagnoses of eating disorders, we used interrupted time-series models to compare trends observed in the post-parity period with what would have been expected given trends in the preparity period. These models were estimated by using data aggregated to the month level rather than to the individual enrollee level (and thus did not include demographic or other patient-level variables). To measure federal parity, we created a binary variable that was coded as 0 for the 36 months before parity became effective (2007–2009) and 1 for the 24 months after enforcement of MHPAEA began (2011–2012). Although plans were aware that enforcement of the law would not begin until 2011, previous research has documented that many plans dropped quantitative treatment limits that were not at parity with general medical benefits when the law became effective in 2010 (13,20). Consequently, the year 2010 was treated as a transition period (because the law had become effective but was not yet being enforced), and the 12 months of 2010 were dropped from the analysis.

To measure time, we created a continuous variable that indicated the time in months from federal parity enforcement (values ranged from –35 to 36). We included an interaction between time and parity and 12 binary variables for the calendar months to account for seasonal variation in outcomes (for example, monthly variation in out-of-pocket spending due to deductibles that restart in January of each year) and in

the symptomology of eating disorders (21). The two key variables of interest were the parity coefficient, which captured changes at the time of MHPAEA enforcement in a given outcome, and the time × parity interaction coefficient, which reflected changes in the trend of outcomes of interest over time because of parity enforcement. A statistically significant coefficient on either or both of these terms indicated that MHPAEA had an effect on the outcome. We also show a joint F test for the full effect of MHPAEA during the first year of its enforcement that combined the parity and parity × time coefficients.

The models were fit with 60 monthly observations, aggregated across individuals. Variances were calculated by using Yule-Walker first-

order autoregressive parameters to account for correlation between consecutive months. We used SAS, Version 9, statistical software to estimate all models. The study was approved by the Harvard Faculty of Medicine Institutional Review Board.

RESULTS

Unadjusted characteristics of the sample of person-years with an eating disorder diagnosis during our study period are shown in Table 1. The size of the eating disorder cohort increased each year because of the sampling strategy (that is, once an individual met inclusion criteria, she remained in the sample for all subsequent calendar years during which she was enrolled for 12 months). Across all years, the vast majority (between 85% and 90%) of the sample was female, and 13% and 29% of individuals were under age 25. Depending on the year, between 37% and 44% had a diagnosis of a co-occurring behavioral health disorder during the calendar year. Average per-person total annual mental health spending ranged from \$3,006 to \$3,829 during the study period, and average annual out-of-pocket spending ranged from \$458 to \$601. Among outpatient mental health service users, the average number of visits per year ranged from 14.7 to 17.6.

Associations between MHPAEA enforcement and mental health service spending are shown in Table 2. We found a significant increase in total mental health spending associated with MHPAEA enforcement, primarily because of a change

in the slope of spending following MHPAEA. During the first year after enforcement (2011), total mental health spending increased by \$1,271.92 ($F=26.35$, $df=1$ and 44 , $p<.001$). There was no significant increase in out-of-pocket mental health spending associated with MHPAEA.

Associations between MHPAEA enforcement and the intensity of mental health services used by individuals with an eating disorder diagnosis are shown in Table 3. We found that parity was associated with increases in the total number of outpatient mental health services used among users of those services. Through the first year after enforcement, these changes translated into 5.8 additional outpatient mental health visits ($F=64.87$, $df=1$ and 44 , $p<.001$), including 2.9 additional psychotherapy visits, on average, among individuals receiving psychotherapy ($F=29.47$, $df=1$ and 44 , $p<.001$). There were no associations between MHPAEA and the number of inpatient mental health days or number of outpatient medication management visits.

DISCUSSION

Enforcement of the federal parity law was associated with increased use of outpatient mental health services, including psychotherapy visits, among individuals with eating disorder diagnoses who accessed these services and increased total mental health spending. In contrast, we documented no changes in out-of-pocket mental health spending after enforcement of the federal law began. These results suggest that the law may have provided some level of financial protection for individuals with eating disorders as they accessed additional mental health services.

These results are consistent with a recent analysis of MHPAEA's impact on children with autism spectrum disorder (ASD), another condition for which many plans have excluded coverage in the past (22). That analysis found similar increases in outpatient service use, with no change in out-of-pocket spending for children with ASD.

There is an extensive literature documenting the effects of earlier parity policies on utilization and spending for mental health and substance use disorder services (15). These studies have generally found that parity results in

TABLE 3. Interrupted time-series models of changes in intensity of mental health service use among individuals with an eating disorder diagnosis, 2007–2012^a

Variable	Coefficient	SE	p	Effect through first year postparity ^b		
				Estimate	F ^c	p
Mean N of inpatient mental health days per month per inpatient user				15.74	2.17	.148
Parity	1.715	1.126	.135			
Time	-.014	.021	.528			
Parity × time	-.022	.044	.620			
Mean N of outpatient mental health services per month per outpatient user				5.78	64.87	<.001
Parity	.192	.076	.016			
Time	-.006	.001	<.001			
Parity × time	.016	.003	<.001			
Mean N of outpatient psychotherapy services per month per psychotherapy user				2.89	29.47	<.001
Parity	.257	.057	<.001			
Time	-.001	.001	.201			
Parity × time	-.001	.002	.692			
Mean N of outpatient medication management services per month per medication management user				-.63	2.20	.145
Parity	.011	.044	.800			
Time	.001	.001	.260			
Parity × time	-.003	.002	.059			

^a Conditional on using the specific service in a given month

^b Estimates for first year postparity reflect the effect of parity through the first year of parity enforcement (2011).

^c $df=1$ and 44

improved financial protection for users of these services, with little or no increase in total spending for this care. However, no studies have looked specifically at impacts on individuals with eating disorders. In contrast to many other psychiatric disorders, eating disorders result in numerous important general medical effects, including widespread changes to the cardiovascular, neurologic, hematologic, and endocrine-reproductive systems (8).

Early analyses of the implementation of MHPAEA found that most plans were complying with the law by offering mental health and substance use disorder benefits that were at least as generous as general medical benefits (13,23). However, a sizeable minority of plans were not complying with all provisions of the law. As noted above, Horgan and colleagues (13) documented that nearly a quarter of commercial plans did not cover eating disorder services in the first year after the law's implementation, before regulations intended to guide MHPAEA implementation had been released. Study of more recent MHPAEA compliance is needed to understand how services for individuals with eating disorders are being covered after final MHPAEA regulations went into effect in 2015.

Our study had several limitations. First, the study lacked a comparison group, a common limitation in studies of policy changes that are implemented nationally. As a result, our findings could be sensitive to other changes in service use and expenditures that occurred at the time of parity implementation but were unrelated to it. Second, claims data

lack detailed clinical information that would be useful in understanding the association between federal parity and mental health service use among individuals with eating disorder diagnoses. Claims data also lack information on benefit design that would allow us to understand specific changes that may have been made to coverage of eating disorder treatment services after MHPAEA's implementation, and claims data also lack information on service use not reimbursed by insurance (that is, services paid for entirely out of pocket). Third, we were unable to study the probability of mental health service use among individuals with eating disorders by using this design because of concerns about possible changes in diagnosis coding practices after parity law implementation. However, our design allowed us to examine changes in intensity of mental health service use among those individuals diagnosed as having an eating disorder at any point during the study period.

Fourth, although the MarketScan database allowed us to study MHPAEA's impacts on more than 27,000 individuals with eating disorder diagnoses enrolled in commercial health plans, MarketScan includes many large, self-insured plans that tend to have generous coverage relative to the market as a whole, which may limit the generalizability of our findings and may have resulted in a lower-bound estimate of the effect of parity on the outcomes studied (24). Finally, we were unable to include individuals who obtained coverage through the ACA's dependent coverage provision because this provision and MHPAEA were implemented in the same year (that is, including these individuals could have resulted in our conflating effects of the parity policy with population changes resulting from the dependent care provision). Nevertheless, this study provides the first evidence of the association between the federal parity law's implementation and mental health spending and intensity of service use among adolescents and adults with a diagnosis of an eating disorder.

CONCLUSIONS

Using a large national database of privately insured individuals, we found increased intensity of service use with no increase in out-of-pocket spending for enrollees with eating disorders, suggesting improved financial protection for individuals with eating disorders and their families. The long-term impact of the law on individuals with eating disorders will depend on plans' future compliance with parity provisions and on how plans respond to the flexibility in the law regarding which diagnoses to cover. The 21st Century Cures Act, passed in December 2016, includes provisions intended to tighten enforcement of MHPAEA and may affect plan coverage decisions and utilization among individuals with eating disorders in the future. Additional research will be necessary to understand the effects of parity requirements on this population as additional legislative and regulatory changes to the health insurance market are made.

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