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One-Year Use and Cost of Inpatient and Outpatient Services Among Female and Male Patients with an Eating Disorder: Evidence from a National Database of Health Insurance Claims

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Abstract: Objective: This study examined rates and cost of inpatient and outpatient treatment among 1,932 patients with an eating disorder. Method: One-year (1995) data were available through MarketScan®, a national insurance database containing claims for 1,902,041 male patients and 2,005,760 female patients. Results: Female patients (n = 1,756, 0.14% of all females) were significantly more likely to have been treated for an eating disorder than male patients (n = 176, 0.016% of all males), and females received more days of treatment than males. Outpatient treatment was the norm, regardless of gender or type of eating disorder. Average number of days (inpatient or outpatient) was less than the minimum recommended by standards of care. Age-adjusted costs for the treatment of anorexia nervosa and bulimia nervosa were comparable to the cost of treatment for schizophrenia. Discussion: The utilization data are discussed in terms of barriers to care and treatment guidelines for eating disorders. © 2000 by John Wiley & Sons, Inc. Int J Eat Disord 27: 381–389, 2000.

Key words: eating disorders; treatment; health services utilization

INTRODUCTION

Lay groups and professional organizations in the United States are advocating for the inclusion of eating disorders into the category of “serious mental illness” in an effort to achieve coverage of health care costs for the treatment of eating disorders. For these efforts, advocates can draw upon an extensive scientific literature documenting the severe

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adverse impact on health and mental health of eating disorders, including a broad set of serious, and often chronic, secondary health problems ranging from infertility to osteoporosis (Pike & Striegel-Moore, 1997). Moreover, anorexia nervosa (AN) has the highest mortality rate of any psychiatric disorder (Sullivan, 1995).

Advocates are emphatic about the need for adequate funding for treatment of eating disorders, not only because the suffering caused by eating disorders is well documented but also because treatment interventions of proven efficacy are available. For example, promising psychotherapeutic and pharmacological treatments have been identified for bulimia nervosa (BN; Schmidt, 1998). Although the treatment outcome literature is less clear regarding the particular treatment strategy of choice for AN, experts agree that AN requires intensive medical and psychological treatment (van Furth, 1998).

The current advocacy efforts in the United States occur in an almost complete vacuum of data about the health services utilization of individuals who experience an eating disorder. Likely, in part this gap in knowledge is due to the relatively low prevalence rates of eating disorders, making these disorders too small a unit for detailed analysis in major epidemiological studies. For example, the Epidemiological Catchment Area Study identified only a total of 20 cases with AN in a nationally representative sample of some 20,000 adults (Robins & Regier, 1991). The National Comorbidity Survey (Kessler et al., 1994), a more recent nationally representative study of prevalence and correlates of mental disorders, reported on health services utilization for mood, anxiety, substance use disorders, and psychoses, but not for eating disorders (Kessler et al., 1999).

Increasingly, insurance claims databases are recommended for use in health services research to answer questions about utilization and cost of services (Quam et al., 1993). Despite their inherent limitations when used in the absence of independent validation of the information they contain, these databases nevertheless may be used for answering a number of descriptive questions and for generating hypotheses. At this stage of knowledge, even the answer to the fundamental question of how many individuals receive treatment for an eating disorder in the United States is not known. Related, systematic data regarding the cost of treatment for these disorders have not yet been reported.

The present report seeks to begin to address this gap by examining a large database of insurance claims data of a population of over 4 million male and female individuals who were covered by some form of health insurance during the course of a 1-year period (1995). Specifically, this report provides detailed information regarding gender and age distribution of patients treated for an eating disorder and examines treatment intensity (in number of days of services received) and cost of treatment. In an effort to put our cost data into perspective, the total annual cost for the treatment of eating disorders is compared to total annual treatment cost for two comparison groups: patients with schizophrenia and patients with obsessive-compulsive disorder (OCD). These two groups were chosen for the following reasons. Schizophrenia was highlighted as an important comparison group in a study of inpatient service use among patients with AN in a New Zealand study using a national database of hospital records (McKenzie & Joyce, 1992). OCD was chosen because of the shared clinical features between AN and OCD, contributing to the conceptualization by some experts of AN as sharing with OCD certain biological vulnerability factors (Kaye, Weltzin, & Hsu, 1993; Pollice, Kaye, Greeno, & Weltzin, 1997). Moreover, both schizophrenia and OCD are widely recognized to represent serious mental disorders requiring treatment, and cost data regarding these diagnostic categories provide an informative reference point for interpreting the costs associated with treating eating disorders.
METHODS

Source of Data

This report is based on the MarketScan® database for 1995. This database was developed by the Medstat Group, Inc., a private research-consulting firm that works directly with large employers to develop health care claims databases. The MarketScan database contains annual inpatient and outpatient health care service use data for individuals who are covered by benefit plans of large employers. The MarketScan databases are constructed from privately insured paid medical and prescription drug claims. Approximately 65 individual employers contribute annually to the MarketScan database. Each employer database is constructed by collecting the raw data from the appropriate payer(s). These data represent the psychiatric and medical service use of insured active employees, early retirees, COBRA participants, and their dependents. No Medicare, Medicaid, or Workers Compensation data are included. Collectively, the databases incorporate private sector health data from almost 200 health care payers, including commercial insurance companies, Blue Cross and Blue Shield plans, and third party administrators. The health care plan types can be classified into one of five categories: basic indemnity, comprehensive indemnity, point of service, preferred provider organization, and exclusive provider organization.

Participants

For 1995, data are available on 1,902,041 males and 2,005,760 females. (A table documenting the geographic diversity of the sample is available upon request.) Diagnoses are based on the International Classification of Disease, 9th ed., Clinical Modifications (ICD-9CM; Department of Health and Human Services, 1991).

Service Use and Cost Data

Each claim includes the diagnostic code of the condition for which a health service was received. Service use (outpatient and inpatient) is reported in units of days. If more than one service was received on 1 day (e.g., doctor’s visit and laboratory test), only 1 day of service use is reported in the database. Costs are recorded as actual costs of treatments including any out-of-pocket expenses the patient may have incurred.

Data Analyses

Group differences were examined using chi-square analyses for categorical data and multivariate analyses of variance (MANOVA) followed by planned univariate post-hoc comparisons for continuous variables. Multivariate analyses comparing total annual cost for the treatment of eating disorders, schizophrenia, and OCD were calculated first without adjusting for age (testing whether any of the diagnostic groupings per se was significantly more expensive), and then with adjusting for the potentially confounding influence of age on treatment costs.

RESULTS

Characteristics of Patients Receiving Treatment for an Eating Disorder

The 1995 MarketScan database contained 21,576 claims for an eating disorder, constituting 1.1% of all claims for a mental disorder (N = 1,954,833) and representing treatments
received by 1,932 patients. Specifically, 517 female patients (0.028% of all female patients included in the 1995 MarketScan database) and 49 male patients (0.0045%) were treated for AN. Hence, among patients with AN, females (91.3%) outnumbered males (8.7%) by a factor of almost 10. Treatment claims for BN were reported for 725 female (0.036%) and 41 male (0.0022%) patients. Thus, there was an almost 20-fold greater number of females (94.6%) than males (5.4%) with treatment claims for BN. Lastly, about 10 times more females (88.7%) than males (11.3%) were treated for eating disorder not otherwise specified (EDNOS); 756 females (0.088%) and 176 males (0.009%).

Because 288 female and 11 male patients had claims for more than one eating disorder, the total number of females and males with any eating disorder was 1,756 and 176, respectively. Forty-five females and 1 male were treated for AN and BN; 73 female and 5 male patients were treated for AN and EDNOS; and 107 female and 5 male patients had received treatments for BN and EDNOS; and 3 female patients had claims for all three eating disorders.

In each eating disorder group, females were younger than males but these age differences did not reach statistical significance (mean age AN\text{female} = 24.8, SD = 12.5, AN\text{male} = 28.6, SD = 17.6, t = 1.47, p = .15; mean age BN\text{female} = 27.9, SD = 10.7, BN\text{male} = 32.0, SD = 15.8, t = 1.67, p = .10; mean age EDNOS\text{female} = 30.4, SD = 13.4, EDNOS\text{male} = 31.6, SD = 18.6, t = 0.65, p = .52). Therefore, data of males and females were combined in subsequent analyses regarding age. The three eating disorder groups differed significantly in age (F = 20.54, p < .0001): Patients with AN (mean age = 25.08, SD = 13.05) were significantly younger than patients with BN (mean age = 28.08, SD = 11.03) or EDNOS (mean age = 30.50, SD = 14.23). Patients with BN and patients with EDNOS did not differ in age.

Age was not evenly distributed, however, and for further descriptive purposes, patients were grouped into four age categories: under 18 years, 18–34 years, 35–54 years, and 55 years or older. Across all types of eating disorders, only a minority of individuals with treatment claims for an eating disorder was 55 years or older (AN: 4.7%, BN: 1.7%, EDNOS: 5.1%). Among patients treated for AN, 38.8% were under 18 years of age and 39.9% were young adults (18–34 years). Compared to AN, relatively fewer of the patients with BN (18%) were under 18 years of age. The modal age group for treatment for BN was 18–34 years of age, representing 54% of all cases with BN. In contrast, patients with EDNOS were distributed fairly equally across the three age groups under 55 years of age: 24.2%, 34.6%, and 36.1%, respectively.

**Service Use and Cost of Services Associated with Eating Disorder Claims**

Inpatient treatment was the exception and outpatient treatment was the norm for females and males and across all eating disorders. Only 111 (21.5%) female and 9 (18.4%) male patients were hospitalized for AN; 87 (12%) female and 9 (22%) male patients with BN received inpatient treatment; and 93 (12.3%) female and 12 (6.8%) male patients were hospitalized for EDNOS.

Detailed information regarding length of hospital stay and cost of hospital treatment is displayed in Table 1. Because so few male patients received inpatient services for an eating disorder, we did not test for gender differences in amount of inpatient treatment received (number of days in hospital) or cost of inpatient treatment by type of eating disorder. Inpatient treatment intensity collapsed across eating disorder type and did not differ by gender: the mean number of inpatient treatment days for female patients (n = 220) was 20.74 days (SD = 20.74), compared to 17.20 days (SD = 17.52) for male patients (n = 30, t = -0.68, p = .38). Related, average costs associated with inpatient treatment
Table 1. Inpatient and outpatient treatment intensity and cost for female and male patients with anorexia nervosa (AN), bulimia nervosa (BN), and eating disorder not otherwise specified (EDNOS).

<table>
<thead>
<tr>
<th></th>
<th>Inpatient Treatment</th>
<th>Outpatient Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female Patients</td>
<td>Male Patients</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>M</td>
</tr>
<tr>
<td>AN Days</td>
<td>111</td>
<td>26.0</td>
</tr>
<tr>
<td>AN Cost</td>
<td>17,384</td>
<td>24,394</td>
</tr>
<tr>
<td>BN Days</td>
<td>87</td>
<td>14.7</td>
</tr>
<tr>
<td>BN Cost</td>
<td>9,088</td>
<td>10,579</td>
</tr>
<tr>
<td>EDNOS Days</td>
<td>93</td>
<td>19.9</td>
</tr>
<tr>
<td>EDNOS Cost</td>
<td>13,297</td>
<td>19,280</td>
</tr>
</tbody>
</table>

Note: Costs are reported in U.S. dollars.

(collapsed across eating disorders) for the 24 male patients (mean cost in U.S. dollars = $10,126, SD = 8,358) did not differ from inpatient treatment costs for female patients (n = 220; mean cost = $12,432, SD = 19,153, t = -1.54, p = .13).

As shown in Table 1, female patients with AN (t = -4.14, p < .0001), BN (t = -4.0, p < .0002), or EDNOS (t = -2.27, p < .02) received more outpatient treatment than male patients, respectively. Consistent with this gender difference in outpatient treatment intensity, outpatient treatment costs for female patients with AN (t = -3.98, p < .001), BN (t = -2.4, p < .02), or EDNOS (t = -2.53, p < .01) were greater than for male patients, respectively.

Comparison of Treatment Costs for Eating Disorders with Treatment Costs for Schizophrenia and OCD

To permit comparison of treatment costs for eating disorders with costs for the treatment of other serious mental disorders, inpatient and outpatient cost data were collapsed for a 2 (gender) × 5 (diagnostic category) analysis of variance (ANOVA). Results are shown in Table 2. The main effect for gender (F = 0.94, p = .33) and the Gender × Diagnostic Category interaction term (F = 1.30, p = .27) was not significant. A significant main effect was found for diagnostic category (F = 50.90, p < .0001). Planned Tukey post-hoc comparisons (p < .05) showed that treatment costs for AN did not differ significantly from treatment costs for schizophrenia, but were significantly higher than costs for OCD. Costs for treatment of BN were significantly lower than for schizophrenia but significantly higher than for OCD. Treatment costs for EDNOS were significantly lower than costs for schizophrenia but did not differ significantly from costs for the treatment of OCD. Adjusting for age did not substantively change these group differences, with one exception: treatment costs for BN did not differ significantly from treatment costs for schizophrenia when adjusting for group differences in age. (Age-adjusted means available upon request.)

DISCUSSION

To date, in the United States, little is known about health services utilization among individuals with an eating disorder. To begin to address this gap, the present study
Table 2. Mean cost per year for treatment (inpatient and outpatient combined) of anorexia nervosa (AN), bulimia nervosa (BN), eating disorder not otherwise specified (EDNOS), schizophrenia, and obsessive-compulsive disorder (OCD)

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Female Patients</th>
<th></th>
<th></th>
<th>Male Patients</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>AN</td>
<td>510</td>
<td>6,045</td>
<td>15,071</td>
<td>49</td>
<td>2,746</td>
<td>5,476</td>
</tr>
<tr>
<td>BN</td>
<td>721</td>
<td>2,962</td>
<td>5,963</td>
<td>41</td>
<td>3,885</td>
<td>7,138</td>
</tr>
<tr>
<td>EDNOS</td>
<td>755</td>
<td>3,207</td>
<td>8,972</td>
<td>94</td>
<td>2,165</td>
<td>4,000</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>1,989</td>
<td>4,824</td>
<td>9,844</td>
<td>1,606</td>
<td>5,093</td>
<td>9,740</td>
</tr>
<tr>
<td>OCD</td>
<td>1,391</td>
<td>3,930</td>
<td>5,526</td>
<td>1,253</td>
<td>1,803</td>
<td>4,842</td>
</tr>
</tbody>
</table>

Note: Costs are reported in U.S. dollars. Gender differences are not significant. Significant differences in cost: AN > EDNOS, OCD; BN > OCD; Schizophrenia > BN, EDNOS, OCD. In age-adjusted analyses (data not shown), results remain unchanged except the treatment costs for BN and schizophrenia do not differ significantly.

sought to provide basic descriptive data regarding health services use by individuals with an eating disorder. Toward this aim, a large national health insurance database was examined that included claims data for children and adults in the United States. The limitations inherent in working with such data need to be acknowledged. These data cannot be used confidently to determine prevalence rates of eating disorders because independent verification of diagnoses was not possible. Moreover, the data are descriptive and do not permit to answers to questions about the reasons underlying clinical decisions such as whether to use outpatient treatment exclusively or how long to treat a particular person. The value of this data set lies in its opportunity to provide a snapshot account of how many individuals received treatment in a given time period where the health care provider justified the treatment with an eating disorder diagnosis. This offers a starting point for discussions of barriers to accessing care, adequacy of the intensity of treatments, and cost implications of providing care.

European studies suggest that only a fraction of individuals seeks treatment specifically for their eating disorder (Hoek, 1995; Rathner & Rainer, 1997; Turnbull, Ward, Treasure, Jick, & Derby, 1996). Similarly, we found that only a small number of individuals received treatment for an eating disorder, and our sample’s treatment rates appear to be comparable with rates reported based on a database of primary care physicians in England (Turnbull et al., 1996).

The gender distribution of AN observed in our study (9% of AN cases were male) is consistent with gender ratios reported for AN in epidemiological studies (Hoek, 1993; Garfinkel et al., 1996; van Hoeken, Lucas, & Hoek, 1998). In contrast, only 5% of BN cases were male in our sample, even though epidemiological studies have reported that 1 in 10 cases is male (Carlat & Camargo, 1991; Garfinkel et al., 1995; van Hoeken et al., 1998). As Hoek (1995) has shown, patients who seek treatment for an eating disorder are more likely to be diagnosed correctly if they have AN than if they have BN. We speculate that the low rate of males with BN in the present sample suggests that there may be gender-specific barriers to accessing or receiving care for BN.

Patients with AN were significantly younger than patients with BN. Related, a considerably larger percentage of patients with AN than patients with BN were younger than 18 years. The age distribution observed in the present study is consistent with age of onset for eating disorders reported in the largest community-based study of eating disorders in North America (Garfinkel et al., 1995, 1996). The mean age of onset was 17.8 years for AN and 21.4 years for BN in the Canadian sample. It is interesting to note that in our sample,
one of five cases with AN and one in four cases with BN are at least 35 years of age. Clearly, although onset typically occurs during late adolescence, the need for treatment of an eating disorder extends well into adulthood.

In its practice guidelines for AN published in 1993, the American Psychiatric Association (APA) recommended inpatient treatment as part of the standard care for this disorder. Experts continue to emphasize the need for inpatient treatment of AN to ensure intensive medical monitoring and safe weight restoration (Baran, Weltzin, & Kaye, 1995), yet the majority of patients with AN in this study received outpatient care only. Recently, a group of experts has developed criteria for inpatient treatment of AN (Kaye et al., 1999). Research is now needed to determine the clinical utility of these criteria and the differential effectiveness of inpatient treatment (typically followed by outpatient treatment) versus outpatient treatment only. Such research will represent an important step toward evidence-based care for patients with AN.

There is considerable debate about the duration of hospitalization required to be of therapeutic benefit. Some experts propose that hospitalization be used essentially for managing acute medical or psychiatric crises associated with AN. Other experts propose that hospitalization should continue until healthy weight is restored (Kaye, Kaplan, & Zucker, 1996; van Furth, 1998). The mean length of hospital stay was 26 days, a period of time clearly longer than what would be needed for crisis intervention, yet a period too short to achieve safely complete or near complete weight restoration. Moreover, the marked variation in length of stay supports the clinical impression of many experts that there does not seem to be a uniform approach to the treatment of AN in terms of hospital care. Mean length of stay in our database is considerably less than the mean length of hospital stay of 72 days reported in a New Zealand study based on a national database of psychiatric hospitals (McKenzie & Joyce, 1992). The difference in length of stay may, in part, reflect the differences in the source of data: our database included any type of hospitalization whereas the New Zealand study utilized records of psychiatric hospitals. It is plausible that psychiatric hospitals treat more seriously ill patients or patients who have failed to show significant improvement in general hospitals. These methodological differences notwithstanding, it is well documented that cultural differences, including differences in health care coverage, contribute to differences in use of hospitalization for the treatment of psychiatric disorders.

Perhaps even more surprising than the relative low number of patients receiving inpatient care for AN is the relatively low intensity of outpatient care: on average, patients with AN received 17 days of outpatient care per year. The considerable range in number of days, however, suggests that some patients received high levels and others minimal levels of care. It is interesting to note that male patients with AN received significantly less outpatient care than female anorexic patients. It is not clear whether these gender differences in treatment intensity reflect gender differences in clinical severity, patients' willingness to participate in more lengthy treatment, or gender biases in the treatment of AN.

Outpatient care also was the norm in the treatment of individuals with BN. Empirically validated psychotherapeutic treatments of BN typically involve a series of 20 outpatient sessions (Agras, 1991; Mitchell & Peterson, 1997; Schmidt, 1998). In contrast, the mean number of outpatient visits reported in this study was 16 among females and 9 among males. Hence, the typical treatment of the patients included in this database was less intensive than the 20 sessions used in most empirically based treatments that have been developed in recent years. Even when applying a relatively more modest standard of a minimum of 15 sessions (to accommodate the fact that some recent trials have utilized less than 20 but at least 15 sessions; see Schmidt, 1998), only 39% of bulimic patients received
this level of care. The reasons for this undertreatment of BN and its clinical implications need to be explored further. Also, the relatively low number of outpatient visits among male compared to female patients warrants further investigation. Our data suggest that eating-disordered males may be at a double disadvantage relative to females: they are less likely to receive treatment and those who do are more likely to receive less care.

Our data show that, per patient, treatment for AN and BN was comparable in cost to treatment of schizophrenia. However, the overall financial burden due to the treatment of AN or BN is lower than that attributable to schizophrenia because there were relatively fewer patients with AN and BN than with schizophrenia. Costs for the treatment of AN and BN were significantly higher than costs for the treatment of OCD. In part, these cost differences likely reflect the fact that OCD, although a serious behavioral disorder, is not associated with the range of serious medical complications that characterize eating disorders and warrant costly medical interventions (Pike & Striegel-Moore, 1997).

Treatment costs for individuals with EDNOS were significantly lower than costs associated with the treatment of AN but comparable to costs for BN. Patients with EDNOS represent a sizable number of individuals with an eating disorder, yet have become only recently the focus of empirical studies (for review, see Striegel-Moore & Marcus, 1995). Consistent with previous studies (Striegel-Moore, Garvin, Dohm, & Rosenheck, 1999; Yanovski, 1993), we found that compared to the patients with AN or BN, patients with EDNOS are more likely to be male and include a larger proportion of older individuals. More research is needed to describe the clinical picture and treatment needs of these patients.

The utilization and cost data reported here suggest that many individuals who suffer from an eating disorder go untreated: The rates of eating disorders observed in this national database are about one tenth of the point prevalence rates of eating disorders reported in epidemiological studies (van Hoeken et al., 1998). Our results suggest further that among those who receive treatment, a considerable subset of patients is being treated at a level of intensity that may be less than adequate. Our data do not permit us to determine the extent to which these limited levels of intensity are a function of limits in insurance coverage. Future studies need to explore the barriers to accessing care and to receiving adequate levels of care. Research also needs to examine whether lower levels of care are associated over time with less favorable outcome and, paradoxically, greater treatment costs. An important next step will be to utilize the MarketScan database to track patients over time to begin to answer these questions about the long-term implications of varying levels of care.

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