Trends in U.S. Emergency Department Visits for Anxiety-Related Mental Health Conditions, 1992–2001

Rebecca P. Smith, M.D.; G. Luke Larkin, M.D.; and Steven M. Southwick, M.D.

Objective: To describe trends in anxiety-related mental health visits to U.S. emergency departments, an expanding portal of access for mental health care.

Method: Data from 1992 through 2001 were obtained from the National Hospital Ambulatory Medical Care Survey using mental health–related ICD-9-CM, E- and V-codes as well as National Center for Health Statistics–assigned Patient Reason-for-Visit classification codes. Population-weighted anxiety-related emergency department visit rates were analyzed over time by age, gender, race, Hispanic ethnicity, insurance status, urban status, region of the country, urgency of presentation, and use of medication.

Results: There were 53 million mental health–related visits, increasing from 4.9% to 6.3% of all emergency department visits ($p = .003$) and from 17.1 to 23.6 per 1000 U.S. population across the decade ($p = .000$). Anxiety-related visits were common (16% of all mental health visits) and increased significantly from 3.5 to 5.0 visits per 1000 U.S. population over the decade ($p = .011$). Anxiety-related visits increased significantly among non-Hispanic whites, children (< 15 years), adults younger than 49 years, and the privately insured; changes among Medicare, Medicaid, and self-pay patients were not significant. Overall hospitalization rates declined from 23% to 21% between 1992 and 2001 ($p = .037$), but they did not change significantly for anxiety-related visits (8%), which remained the least likely visit type to be admitted of all mental health visits for the entire decade. In contrast to rural emergency departments, urban emergency departments witnessed significant increases in anxiety-related visits, rising from 2.9 to 5.2 per 1000 U.S. population across the decade (p trend = 0.007). Regionally, anxiety-related visits were highest in the Northeast, lowest in the West, and increased significantly in only the South and Northeast.

Conclusion: During the decade, there was an expansion of anxiety-related visits to U.S. emergency departments, reflecting an increase in anxiety-related emergency department care-seeking, an increase in anxiety awareness among patients and practitioners, or both.

(J Clin Psychiatry 2008;69:286–294)

Received Jan. 10, 2007; accepted June 7, 2007. *From the Department of Psychiatry, Mount Sinai School of Medicine, New York, N.Y. (Dr. Smith), and Department of Surgery, Emergency Medicine Division (Dr. Larkin), and Department of Psychiatry (Dr. Southwick), Yale University, New Haven, Conn.*

This work was supported in part by the University of Texas, Southwestern Medical Center, Division of Emergency Medicine, Dallas, Tex.

The authors thank Mrs. Lorrie Burkhalter and Dr. Paul Pepe, M.D., for their organizational and administrative support, respectively.

The authors report no additional financial or other relationships related to the subject of this article.

Corresponding author and reprints: G. Luke Larkin, M.D., Department of Surgery, Emergency Medicine Division, Yale University, 464 Congress Ave., Suite 260, New Haven, CT 06519 (e-mail: GLuke.Larkin@yale.edu).

The U.S. surgeon general's report[1] on mental health and the President's New Freedom Commission on Mental Health[2] have both endorsed the need for expanded access to mental health treatment. However, the only guaranteed access to any form of medical care, including mental health care, in the United States remains the emergency department, as established in the Emergency Medical Treatment and Active Labor Act.[3] The role that emergency departments play in what has been described as the de facto mental health care system[4] is poorly understood. With over 114 million visits a year, emergency departments constitute an increasingly important provider of health care, yet the extent to which mental health care for the most common mental disorders is provided in this setting to different demographic groups has not been the topic of systematic study.[5] Recent large-scale studies characterizing access to mental health care in different sectors have not included information on the rates of provision of mental health–related services in emergency departments.[6] It is unclear whether emergency departments might be serving as a "safety net" for treatment of anxiety disorders among groups who generally encounter barriers to access to professional outpatient mental health care (chronically underserved), such as African Americans and Hispanics.[6,7] The 20-year history of national population-based studies of access to treatment for widely prevalent mental illnesses[4,8,9] has only recently come to include a gross analysis of national trends in mental health–related visits to emergency departments.[10] More information is clearly needed about the nature of these increases in mental health–related presentations to emergency departments. This report represents the first at-

tempt to characterize national trends in anxiety-related visits to emergency departments.

Anxiety disorders are the most prevalent of mental disorders in the United States, with 28.8% lifetime prevalence and 18.1% 12-month prevalence,[11] and they tend to have both an early onset (6–21 years) and a chronic course.[12] Anxiety-associated disability includes work-related impairment, decreased income, increased medical illness, increased suicide attempts, somatic complaints, lower quality of life, negative body image, impaired intimacy, and social role dysfunction.[13] Because of their high prevalence, early onset, and associated disability, anxiety disorders impose a larger economic burden on the United States than any other mental disorder.[14] Because effective, evidence-based treatments for anxiety disorders are widely available, the associated suffering, disability, and costs incurred are largely preventable.

While it is generally accepted that patient anxiety often plays a considerable role in the decision to access emergency services for medical treatment, the literature is sparse and narrowly focused on subpopulations in small, local, non–population-based emergency department samples.[15,16] Population trends in anxiety-related emergency department visits have not been the subject of published reports. The literature that does exist suggests that in addition to those who visit emergency departments with the intention of accessing mental health care, many patients who present for treatment of medical issues may nonetheless suffer significant primary and comorbid anxiety-related pathology,[17,18] which can be difficult to distinguish from the normative anxiety associated with perceived need for urgent care. Because symptoms of some anxiety disorders, such as panic disorder, resemble those of acute medical conditions (for example, choking, dizziness, chest pain, palpitations, tachycardia, dyspnea, diaphoresis) they can be difficult for patients to interpret and can result in higher rates of emergency department utilization among those with panic disorder.[19] The Epidemiologic Catchment Area study found that persons with chest pain were 4 times more likely to have panic disorder than were those without chest pain.[20,21]

Given the need for clearer information about the patterns of presentation in emergency departments of widely prevalent and disabling anxiety disorders and symptoms and given the lack of information available from previous prevalence estimates, we sought to identify recent trends in anxiety-related mental health visits to U.S. emergency departments using a national probability sample.

METHOD

Begun in 1992 as part of the ambulatory component of the National Health Care Survey, the National Hospital Ambulatory Medical Care Survey (NHAMCS) measures emergency department and outpatient department utilization by employing a 4-stage probability sample of visits to noninstitutional general and short-stay hospitals, excluding federal, military, and Veterans Affairs facilities in the United States.[22–29] Conducted annually, the NHAMCS covers geographic primary sampling units, hospitals within primary sampling units, emergency departments within hospitals, and patients within emergency departments. Data are hospital staff–collected during annual, randomly-assigned, 4-week data periods and sent to the National Center for Health Statistics (NCHS), where they are coded using the *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM).[30] We used the most recent emergency department component of NHAMCS available (1992–2001).

To maximize case finding, mental health–related emergency department visits were included if their records met any 1 of 3 criteria: (1) DSM-IV-TR–based, major mental health problems (ICD-9-CM diagnosis codes 290.0–305, 307–310, and 311–319.0 or V-codes 61.1–71.02); (2) NCHS-assigned Patient Reason-for-Visit classification codes related to mental health[30] (1100.0–1199.9); and/or (3) injury E-codes related to suicide (E950.0–E959.9). Otherwise, visits that did not meet at least 1 of the above criteria were deemed non–mental health visits. ICD-9-CM codes in the 290–319 range were excluded if they lacked a corresponding DSM-IV–based diagnosis; e.g., psychosexual disorders (302), sleeping disturbances (307.4), physiologic malfunction (306), post-concussive syndrome (310.2), nondependent tobacco use disorder (305.1), and enuresis and encopresis (307.6 and 307.7, respectively).

Anxiety disorders were assigned specific DSM-IV–compatible categories (ICD/DSM-IV 300.00–300.61 except 300.4 [dysthymia]), e.g., generalized anxiety disorder, panic disorder, obsessive-compulsive disorder, posttraumatic stress disorder, acute stress disorder, agoraphobia, and anxiety disorder not otherwise specified, as well as NCHS reasons-for-visit codes 1100.0 (anxiety and nervousness) and 1105.0 (fears and phobias).

National estimates were obtained through the use of a multistage estimation procedure with 3 basic components (inflation by reciprocals of the sampling selection probabilities, adjustment for nonresponse, and a population weighting ratio adjustment) and with patient visit weights. Absolute numbers of emergency department visits were estimated by using census-based, NCHS-assigned patient weights rounded to the nearest thousand. Emergency department visit rates per population were calculated using denominator estimates of the civilian, noninstitutionalized U.S. population from the U.S. Census Bureau and adjusted for underenumeration.[31]

We analyzed emergency department visit rates over time by age, gender, and race/ethnicity (white, non-Hispanic; black, non-Hispanic; other, non-Hispanic; and Hispanic). Although NHAMCS data contain imputed eth-

nicity for 1992 through 1996 in the public-use files, we did not include any imputed or missing data in the ethnicity subanalysis. We also analyzed mental health cases by insurance status, location in a metropolitan versus nonmetropolitan area, use of medication, and region of the country (Northeast, Midwest, South, and West). Metropolitan statistical area and U.S. region categories represent standardized geographical divisions defined by the U.S. Census Bureau.[31]

Visits were further analyzed by time of presentation, mode of arrival, and urgency (urgent/emergent or nonurgent) at triage. From 1992 through 1996, visits were deemed "urgent" versus "nonurgent," but this coding changed in 1997. For consistency, we coded visits that occurred from 1997 through 2001 as "nonurgent/nonemergent" if expected triage time was recorded as > 1 to 2 hours.

In accordance with NCHS recommendations,[32,33] 95% CIs are only provided when the relative standard error is less than 30% and only when there are more than 29 raw data items in the cell or stratum. Ninety-five percent CIs for emergency department visit rates were calculated using the relative standard error of the estimate, controlling for weighting, 4-stage sampling, and cluster effects using generalized estimating equations from SUDAAN-8.0 (Research Triangle Institute, Research Triangle Park, N.C.). The least squares method of linear regression was used for analysis of trends using STATA 7.0 (StataCorp, L.P., College Station, Tex.), with $p < .05$ considered statistically significant. Differences in continuous variables were assessed using 2-tailed independent sample t tests or repeated-measures analysis of variance. Significance testing for multiple comparisons between groups were corrected using the method of Bonferroni.

RESULTS

Overall Trends in Emergency Department Utilization

From 1992 through 2001 there was an estimated total of 974 million visits to emergency departments in the United States. Of 974 million emergency department visits, 52.8 million (95% CI = 49.7 to 55.9 million), or 5.4% (95% CI = 5.1% to 5.7%), were due primarily to mental health problems, as defined by either the patient's reason-for-visit (16.1%) or the diagnosis (83.9%) codes that were documented by clinicians (Table 1). From 1992 through 2001, there were 53 million mental health–related visits, increasing from 4.9% to 6.3% of all emergency department visits ($p = .003$) and from 17.1 to 23.6 per 1000 U.S. population over the decade ($p = .000$). From 1992 through 2001, anxiety-related visits increased proportionally by 43%, from 3.5 to 5.0 per 1000 U.S. population ($p = .011$) and by 35% on an emergency department basis, from 9.8 to 13.2 per 1000 emergency department visits across the decade ($p = .02$).

Age

The mean age for mental health cases overall was 39.5 years, increasing significantly from 38.2 to 40.7 years over the decade (p trend = 0.001). The increase was significant for anxiety disorders (40.7 to 42.7 years, $p < .05$). The youngest (< 15 years) had the lowest age-adjusted rates of anxiety-related visits, reflecting the overall demographics of mental illness in the U.S. population; however, their rates underwent the largest proportional increase, from 0.4 to 0.8 per 1000—a proportional increase of 100% (p trend = 0.010). Trend analysis reveals significant increases for all adult age strata under 49 years of age (Table 2), with the largest proportional increase among adults taking place in the 30- through 49-year-old group, rising from 4.5 to 7.1 anxiety-related emergency department visits per 1000 population, a proportional increase of 58% ($p = .01$) as compared with a proportional increase of 23% among those aged 15 through 29 years, from 4.4 to 5.4 visits per 1000 ($p = .024$, Table 2).

Gender

Overall, mental health visit trends were not significantly different by gender, with visits increasing by 38%, from 16.2 to 22.4 per 1000 in females ($p = .002$), and by 30%, from 17.1 to 22.3 per 1000 in males ($p = .002$). Proportional increases in anxiety-related visits were of similar magnitude in females and males (46% and 42%, respectively); however, females had significantly higher visit rates for anxiety disorders, with an increase from 4.5 to 6.6 ($p = .013$) per 1000 compared with 2.4 to 3.4 among men ($p = .026$).

Race/Ethnicity

Although they are different constructs, race and ethnicity were combined to allow direct comparisons of help seeking by Hispanics, the fastest growing minority population in the United States. An increasing trend for anxiety-related cases by ethnicity is significant for non-Hispanic whites only, with an increase from 3.3 to 5.2 per 1000, a proportional increase of 58% ($p = .015$).

Urban Versus Rural

Over the entire decade, anxiety-related visits were more prevalent in nonmetropolitan than in metropolitan areas on a population basis, 5.9 versus 3.8, respectively, per 1000 U.S. population (Table 3). However, this rural disparity vanished by decade's end with an inverse and significant increase in anxiety visits in urban areas (p trend = 0.007) from 2.9 to 5.2 per 1000, a proportional increase of 79%. The observed decrease in rural areas, from 7.1 to 4.7 per 1000 did not achieve statistical significance.

Regional Variation

In the regional aggregate, the Northeast had significantly more anxiety-related visits per population than did

Table 1. Overall Demographics of Mental Health– and Anxiety-Related Visits to U.S. Emergency Departments: 1992 Through 2001

Variable	All Mental Health–Related Emergency Department Visits				Anxiety-Related Emergency Department Visits	
	No. (95% CI)			Mean (SE)	No. (95% CI)	Mean (SE)
Total, estimated (1,000s)	52,774 (49,676 to 55,872)				11,259 (10,307 to 12,210)	
Age, y				39.5 (0.2)		42.2 (0.4)
	Sample No.[a]	%	No. of Emergency Department Visits per 1,000	Rate per 1,000 Population (95% CI)	Rate per 1,000 Population (95% CI)	
Overall	16,774	100.0	54.2	19.7 (18.6 to 20.9)	4.2 (3.9 to 4.6)	
Age, y						
< 15	1,451	8.7	21.6	8.1 (7.1 to 9.1)	0.6 (0.4 to 0.8)	
15–29	3,951	23.6	51.8	21.6 (19.7 to 23.4)	5.0 (4.2 to 5.8)	
30–49	7,212	43.0	81.7	26.4 (24.4 to 28.3)	5.5 (4.9 to 6.2)	
50–69	2,411	14.4	58.1	16.5 (14.8 to 18.1)	4.7 (3.9 to 5.4)	
≥ 70	1,749	10.4	54.1	25.6 (23.0 to 28.2)	5.4 (4.4 to 6.4)	
Gender						
Female	8,164	48.7	52.1	19.5 (18.2 to 20.8)	5.4 (4.9 to 5.9)	
Male	8,610	51.3	56.5	19.9 (18.6 to 21.3)	2.9 (2.5 to 3.3)	
Race/ethnicity						
White, non-Hispanic	10,346	61.7	69.2	18.6 (17.4 to 19.8)	4.3 (3.9 to 4.7)	
Black, non-Hispanic	3,862	23.0	65.5	31.2 (27.4 to 34.9)	4.6 (3.6 to 5.5)	
Hispanic (all)	1,990	11.9	56.2	17.6 (15.6 to 19.5)	3.9 (3.1 to 4.7)	
Other, non-Hispanic	576	3.4	64.5	12.0 (9.4 to 14.6)	2.5 (1.4 to 3.6)	
Region						
Northeast	5,502	32.8	66.4	24.6 (22.5 to 26.7)	5.1 (4.3 to 5.9)	
Midwest	3,473	20.7	50.4	20.7 (18.9 to 22.6)	4.1 (3.3 to 4.8)	
South	4,368	26.0	47	17.4 (16.1 to 18.7)	4.2 (3.7 to 4.6)	
West	3,431	20.5	60.5	18.1 (16.6 to 19.7)	3.7 (3.1 to 4.3)	
Urban vs rural						
Metropolitan area	14,850	88.5	55.7	19.7 (18.5 to 20.9)	3.8 (3.4 to 4.2)	
Nonmetropolitan area	1,924	11.5	48.9	19.8 (18.1 to 21.6)	5.9 (5.1 to 6.7)	
Insurance status (% of cases)				% (95% CI)	% (95% CI)	
Private	4,552	27.1		29 (27 to 30)	37 (34 to 41)	
Medicare	2,758	21.8		17 (16 to 19)	18 (15 to 20)	
Medicaid	3,657	21.8		20 (19 to 21)	18 (15 to 20)	
Self-pay	3,747	20.7		21 (19 to 22)	17 (15 to 20)	
Other	2,333	13.9		13 (12 to 15)	10 (8 to 12)	
Time of presentation (% of cases)						
0000–0759h	2,048	17.5		17 (16 to 19)	17 (15 to 19)	
0800–1559h	4,524	38.6		37 (35 to 39)	38 (35 to 42)	
1600–2359h	5,146	43.9		46 (44 to 48)	45 (41 to 48)	
Mode of arrival, %[b]						
Walk-in	4,199	64.6		66 (64 to 67)	75 (72 to 78)	
Ambulance	1,640	25.2		25 (24 to 26)	19 (17 to 22)	
Public service	386	5.9		5 (5 to 6)	2 (1 to 4)	
Unknown	276	4.2		4 (3 to 5)	4 (2 to 5)	
Visit characteristics (% of cases)						
Blood alcohol testing	1,644	10.0		15 (14 to 16)	3 (2 to 4)	
Injury-related visit[c]	2,726	16.3		30 (29 to 32)	11 (9 to 13)	
Urgent visit	9,455	57		57 (55 to 60)	55 (51 to 59)	

[a]Total estimate in 1,000s. Emergency department visit rates per population were calculated using denominator estimates of the civilian noninstitutionalized U.S. population from the U.S. Census Bureau and adjusted for underenumeration.
[b]1997–2001.
[c]Based on the Supplementary Classification of External Causes of Injury and Poisoning, *International Classification of Diseases, Ninth Revision, Clinical Modification.*

the West. Over the decade, with the exception of the Midwest, all regions saw significant increases in population-based mental health visits overall. The Northeast saw the greatest increase in mental health–related emergency department visits, growing from approximately 0.9 million in 1992 and 1993 to 1.6 million in 2000 and 2001, an increase of 5.4% to 7.3% (p = .03) of all Northeast emergency department visits. Significant increasing trends for anxiety-related illnesses were seen only in the Northeast (from 4.1 to 5.6 per 1000, p = .044, a proportional increase of 37%) and the South (from 3.1 to 5.4, p = .011, a proportional increase of 74%).

Visit Characteristics

Over half (57%) of all mental health cases were deemed "urgent"; however, this designation was significantly

Table 2. Trends in Mental Health– and Anxiety-Related Visits to U.S. Emergency Departments

Trend	All Mental Health–Related Visits: No.[a]	All Mental Health–Related Visits: Rate per 1000 (95% CI)	Anxiety-Related Visits, Rate per 1000 (95% CI)
Overall		p = .002	p = .011
1992–1993	3360	16.7 (15.0 to 18.3)	3.5 (3.0 to 4.0)
1994–1995	2834	17.7 (16.0 to 19.3)	3.5 (3.0 to 4.0)
1996–1997	2907	19.8 (17.9 to 21.6)	4.1 (3.5 to 4.6)
1998–1999	3307	21.8 (19.6 to 23.9)	4.9 (4.2 to 5.6)
2000–2001	4366	22.3 (20.5 to 24.1)	5.0 (4.4 to 5.6)
Female		p = .002	p = .013
1992–1993	1642	16.2 (14.4 to 18.1)	4.5 (3.7 to 5.2)
1994–1995	1387	17.1 (15.3 to 19.0)	4.3 (3.5 to 5.0)
1996–1997	1401	19.5 (17.4 to 21.6)	5.3 (4.4 to 6.2)
1998–1999	1580	21.7 (19.3 to 24.2)	6.2 (5.2 to 7.3)
2000–2001	2154	22.4 (20.3 to 24.4)	6.6 (5.7 to 7.5)
Male		p = .002	p = .026
1992–1993	1718	17.1 (15.2 to 19.0)	2.4 (1.8 to 2.9)
1994–1995	1447	18.2 (16.2 to 20.1)	2.6 (2.0 to 3.2)
1996–1997	1506	20.0 (17.9 to 22.2)	2.7 (2.1 to 3.3)
1998–1999	1727	21.8 (19.3 to 24.2)	3.5 (2.8 to 4.3)
2000–2001	2212	22.3 (20.2 to 24.4)	3.4 (2.8 to 4.0)
White, non-Hispanic		p = .002	p = .015
1992–1993	2163	15.2 (13.6 to 16.8)	3.3 (2.8 to 3.9)
1994–1995	1766	16.4 (14.8 to 18.0)	3.4 (2.8 to 4.0)
1996–1997	1800	18.0 (16.2 to 19.8)	4.2 (3.6 to 4.9)
1998–1999	1902	21.0 (18.8 to 23.2)	5.3 (4.5 to 6.1)
2000–2001	2715	22.3 (20.4 to 24.3)	5.2 (4.5 to 5.9)
Black, non-Hispanic		p = .234	p = .106
1992–1993	721	26.1 (22.2 to 30.0)	3.8 (2.5 to 5.0)
1994–1995	650	27.1 (22.9 to 31.3)	3.7 (2.3 to 5.2)
1996–1997	696	36.0 (31.0 to 41.0)	5.3 (3.6 to 7.0)
1998–1999	888	34.7 (29.6 to 39.9)	4.9 (3.1 to 6.6)
2000–2001	907	31.4 (27.4 to 35.3)	5.1 (3.7 to 6.5)
Hispanic		p = .853	p = .070
1992–1993	372	18.6 (14.9 to 22.2)	4.8 (3.1 to 6.5)
1994–1995	306	18.0 (14.5 to 21.4)	4.5 (3.0 to 6.1)
1996–1997	318	17.3 (13.8 to 20.8)	2.6 (1.2 to 3.9)
1998–1999	428	17.7 (14.1 to 21.2)	3.5 (1.9 to 5.1)
2000–2001	566	19.0 (16.0 to 22.0)	4.7 (3.3 to 6.1)
Age, y			
< 15[b]		p = .101	p = .010
1992–1993	308	7.7 (5.9 to 9.5)	0.4
1994–1995	260	6.8 (5.1 to 8.5)	0.5
1996–1997	263	8.4 (6.3 to 10.5)	0.6
1998–1999	260	8.3 (6.2 to 10.4)	0.6
2000–2001	360	9.3 (7.3 to 11.2)	0.8 (0.3 to 1.3)
15–29		p = .002	p = .024
1992–1993	819	18.2 (15.1 to 21.4)	4.4 (3.0 to 5.7)
1994–1995	711	20.4 (17.0 to 23.9)	4.6 (3.2 to 5.9)
1996–1997	645	21.4 (17.8 to 25.1)	5.1 (3.6 to 6.6)
1998–1999	773	23.4 (19.2 to 27.7)	5.6 (3.8 to 7.3)
2000–2001	1003	24.1 (20.5 to 27.6)	5.4 (3.9 to 6.9)
30–49		p = .005	p = .011
1992–1993	1396	21.6 (18.4 to 24.8)	4.5 (3.3 to 5.6)
1994–1995	1239	23.9 (20.5 to 27.3)	4.5 (3.3 to 5.7)
1996–1997	1305	26.7 (23.0 to 30.5)	5.1 (3.8 to 6.5)
1998–1999	1451	29.5 (25.2 to 33.9)	6.4 (4.7 to 8.0)
2000–2001	1821	29.6 (26.0 to 33.2)	7.1 (5.6 to 8.5)
50–69		p = .036	p = .122
1992–1993	478	14.6 (11.5 to 17.6)	3.6 (2.2 to 5.0)
1994–1995	361	13.7 (10.6 to 16.7)	3.4 (2.0 to 4.8)
1996–1997	406	17.2 (13.8 to 20.5)	5.2 (3.5 to 6.9)
1998–1999	487	17.7 (14.0 to 21.5)	5.9 (3.9 to 7.8)
2000–2001	679	18.6 (15.5 to 21.7)	5.0 (3.5 to 6.5)
≥ 70		p = .018	p = .133
1992–1993	359	20.6 (15.9 to 25.3)	4.8 (3.0 to 6.7)
1994–1995	263	22.3 (17.3 to 27.2)	4.4 (2.3 to 6.5)
1996–1997	288	22.4 (17.3 to 27.6)	3.9 (1.9 to 5.9)
1998–1999	336	29.5 (23.0 to 36.1)	6.5 (3.7 to 9.3)
2000–2001	503	32.0 (26.2 to 37.9)	7.1 (4.5 to 9.8)

[a]Total estimate in 1000s. Emergency department visit rates per population were calculated using denominator estimates of the civilian noninstitutionalized U.S. population from the U.S. Census Bureau and adjusted for underenumeration.
[b]In accordance with National Center for Health Statistics recommendations,[32,33] 95% CIs are only provided when the relative standard error is less than 30% and only when there are more than 29 raw data items in the cell or stratum.

less common for anxiety-related visits (55%, p < .05) and did not change over time. One quarter (25%) of mental-health visits arrived by ambulance, but significantly fewer anxiety-related visits arrived by ambulance (19%, p < .001).

Medication Trends

Most patients (61%) treated during mental health–related visits received medication at an average of 1.5 medications per visit. Among all mental health–related visits, 25% received 1 and 36% received more than 1 medication. Thus, of all visits in which medications were given, 59% received more than 1 medication; the most common type of agent, comprising 49% of all medications used, was psychotropic medications. Antipsychotics, anxiolytics/hypnotics, and antidepressants were given to 11%, 18%, and 6% of all mental health visits, respectively. Psychotropic drug use increased significantly, from 20.4% to 30.9% of all mental health–related visits across the decade, a proportional increase of 51% (p trend = 0.000). The next most common class of medication that was used was analgesics, given to 17.9% (95% CI = 15.8% to 20.0%) of all mental health visits, but trends for analgesic use (17.3% to 21.5%, p = .12) did not track the 50% increase seen in the use of psychotropic medication over time. For anxiety-related disorders, medications of some sort were used in over two thirds (68.5%) of emergency department visits. This remained stable over the decade from 66.7% in 1992 through 1993 to 69.7% in 2000 through 2001. However, there was a significant proportional increase in the use of anxiolytic/hypnotic drugs, increasing from 41.3% of anxiety visits in 1992 through 1993 to 51.2% in 2000 through 2001 (p = .020).

Table 3. Regional Trends for Mental Health– and Anxiety-Related Visits to U.S. Emergency Departments

Region	All Mental Health–Related Visits, No.[a]	All Mental Health–Related Visits, Rate per 1000	Anxiety-Related Visits, Rate per 1000
Northeast		p = .022	p = .044
1992–1993	967	18.1 (15.6,20.6)	4.1 (3.1,5.0)
1994–1995	772	23.3 (20.3,26.3)	5.1 (3.9,6.3)
1996–1997	877	25.3 (22.0,28.6)	5.1 (3.8,6.4)
1998–1999	1330	28.5 (24.4,32.5)	5.8 (4.2,7.3)
2000–2001	1556	27.8 (24.6,31.0)	5.6 (4.3,6.8)
Midwest		p = .232	p = .318
1992–1993	753	20.5 (17.8,23.2)	3.6 (2.6,4.6)
1994–1995	734	18.8 (16.3,21.4)	2.5 (1.7,3.4)
1996–1997	652	21.2 (18.4,24.0)	4.9 (3.7,6.0)
1998–1999	572	21.5 (18.6,24.5)	5.0 (3.8,6.2)
2000–2001	762	21.5 (19.0,24.0)	4.2 (3.3,5.2)
South		p = .002	p = .011
1992–1993	878	13.7 (11.9,15.4)	3.1 (2.4,3.8)
1994–1995	716	15.1 (13.2,17.0)	3.4 (2.6,4.2)
1996–1997	777	16.9 (14.8,19.0)	3.7 (2.8,4.5)
1998–1999	844	20.0 (17.5,22.6)	5.1 (4.0,6.2)
2000–2001	1153	20.8 (18.6,23.0)	5.4 (4.4,6.3)
West		p = .018	p = .117
1992–1993	762	16.0 (13.6,18.3)	3.3 (2.4,4.2)
1994–1995	612	15.4 (13.1,17.7)	3.1 (2.2,4.1)
1996–1997	601	18.0 (15.5,20.4)	2.9 (2.1,3.8)
1998–1999	561	19.0 (16.1,21.8)	3.9 (2.8,5.0)
2000–2001	895	21.8 (19.2,24.4)	4.9 (3.9,6.0)
Metropolitan area		p = .000	p = .007
1992–1993	3010	15.1 (13.5,16.7)	2.9 (2.4,3.4)
1994–1995	2561	17.5 (15.9,19.2)	3.2 (2.7,3.7)
1996–1997	2470	19.6 (17.8,21.5)	3.5 (2.9,4.0)
1998–1999	2903	22.1 (19.8,24.3)	4.3 (3.6,5.0)
2000–2001	3906	24.5 (22.5,26.6)	5.2 (4.5,5.8)
Nonmetropolitan area		p = .035	p = .536
1992–1993	350	26.9 (23.1,30.7)	7.1 (5.4,8.8)
1994–1995	273	18.3 (15.5,21.0)	4.8 (3.5,6.2)
1996–1997	437	20.2 (17.4,23.0)	6.3 (4.9,7.7)
1998–1999	404	20.8 (17.8,23.7)	6.9 (5.4,8.4)
2000–2001	460	16.1 (13.8,18.3)	4.7 (3.6,5.9)

[a]Total visits in 1000s.

Mental Health Case Mix

An estimated 17 million visits had a mental health primary complaint, but many more were given a psychiatric diagnosis. Of the estimated 53 million mental health–related visits overall, anxiety disorders (21%) were second only to substance-related (30%) and mood disorders (23%) as the most common mental health–related diagnosis assigned.

Trends in Mental Health Patient Disposition

National admission rates for mental health visits decreased from 22.6% to 20.8% across the decade (p trend = 0.037) and were lowest among those with anxiety disorders (8%). The proportion of anxiety patients admitted after emergency department stabilization, however, remained stable over time. Although mean wait times (379 minutes, or just over 6 hours) did not change significantly for all mental health visits, the left-before-being-seen rates increased over the years they were recorded consecutively from 1995 through 2001: 0.3%, 1.0%, 0.7%, 1.7%, 2.1%, 1.2%, 2.4% (p trend = 0.02). However, the left-before-being-seen rates for anxiety patients were too low to measure.

Insurance Status

Of all mental health visits, 29% were funded from the private sector and 37% were funded from the public sector. Over the decade, a significantly increasing share of all private sector and Medicare emergency department visits were mental health related, increasing from 3.4% to 4.5% and 5.8% to 7.8%, respectively (p trend = 0.01 for both). These trends resulted in part from increasing numbers of anxiety-related cases for privately-funded patients from 34.1% to 39.7%, a proportional increase of 16%, which was statistically significant (p = .01; Table 4).

DISCUSSION

The decade between 1992 and 2001 saw a substantial national increase in the per person trend in anxiety-related visits to U.S. emergency departments, representing 16% of all mental health–related visits.

Despite the fact that anxiety disorders are more prevalent than other mental disorders in the general population, anxiety-related visits were not the most common of mental health–related emergency department visits. There are many possible reasons for this. First, the emergency department is especially designed for acute care, and anxiety disorders were likely deemed less urgent than other mental health visits in NHAMCS. Indeed, the most widely prevalent anxiety disorders have a course which has been characterized as chronic, persistent, and less severe than many of the other disorders for which patients seek emergency care.[34] In the National Comorbidity Survey Replication, only 22% of anxiety disorder cases were ranked "serious,"[12] yet over half (55%) of anxiety-related visits were triaged as "urgent," which suggests that emergency department care for anxiety may not have been sought until a certain symptomatic threshold was exceeded.

Other factors inherent in particular anxiety disorders are likely to interfere with access to traditional outpatient treatment, and they may have contributed to initial presentation of anxiety disorders in emergency departments. As previously noted, panic attacks are associated with multiple somatic symptoms, such as chest pain, that resemble those of common acute medical conditions. Although only about 60% of persons with panic attacks seek care,[35] nearly one third (32%) present to emergency departments compared with 26% who present to a mental health setting.[36]

On average, 9 to 23 years elapse between the time individuals first develop an anxiety disorder and the time they make their first treatment contact, the longest delay

Table 4. Mental Health– and Anxiety-Related Emergency Department Visit Trends by Insurance Status

Status	Visits Related to Mental Health, %	All Mental Health Visits, %	All Mental Health Visits Admitted, %	All Anxiety-Related Visits, %
Private	p = .013	p = .331	p = .064	p = .010
1992–1993	3.4	27.1	21.0	34.1
1994–1995	3.6	28.5	21.3	35.1
1996–1997	4.1	29.2	20.6	38.3
1998–1999	4.0	26.7	18.0	38.4
2000–2001	4.5	31.1	18.6	39.7
Medicare	p = .005	p = .535	p = .067	p = .968
1992–1993	5.8	18.6	37.8	21.0
1994–1995	5.9	15.3	37.4	14.9
1996–1997	6.4	14.9	35.6	13.5
1998–1999	7.1	18.1	35.4	19.0
2000–2001	7.8	19.7	35.8	18.7
Medicaid	p = .157	p = .608	p = .379	p = .666
1992–1993	5.2	22.9	20.1	19.1
1994–1995	5.1	17.8	24.3	16.1
1996–1997	7.1	18.8	21.9	17.8
1998–1999	7.0	21.3	19.2	18.2
2000–2001	6.5	19.1	19.1	17.1
Self-pay	p = .322	p = .643	p = .252	p = .363
1992–1993	6.6	18.8	16.1	28.3
1994–1995	6.4	19.5	17.7	29.1
1996–1997	8.1	23.5	18.1	39.2
1998–1999	7.9	21.3	15.0	35.6
2000–2001	7.2	19.6	13.9	32.6
Other	p = .319	p = .374	p = .810	p = .368
1992–1993	4.9	12.5	19.5	19.9
1994–1995	5.3	18.9	28.7	21.1
1996–1997	5.2	13.6	21.9	13.6
1998–1999	5.6	12.6	23.1	18.6
2000–2001	5.2	10.5	20.6	16.2

of treatment initiation of any mental health disorder.[37] The early age at onset for the anxiety disorders, combined with the long delay in initiation of treatment may explain why the youngest patients (< 15 years) had the lowest age-adjusted rates of anxiety-related visits, and the largest proportional increase among adults took place among the 30- through 49-year-old group, rising from 4.5 to 7.1 anxiety-related emergency department visits per 1000 population, an increase of 58% (p = .01) compared with a proportional increase of only 23% among those aged 15 to 29 years.

An additional reason for increasing emergency department presentations for anxiety-related conditions is that alternative sources of care are lacking. Mental health carve-out, uninsurance, managed care restrictions, and poor quality of outpatient psychiatric care may all contribute to the increase.[38] A recent national study of mental health service use in the United States reported that only 32.7% of treated patients with mental disorders were receiving adequate treatment.[39]

In urban areas, the rate of anxiety-related visits increased from 2.9 to 5.2 per 1000, a proportional increase of 79.2%, with a nonsignificant decrease in visits in rural areas. This increase may reflect the extent to which emergency medicine has been concentrated in urban areas[40] and the extant shortages of board-certified emergency physicians in rural areas.[41,42] Do estimates of emergency physician workforce underestimate current needs? Board certification suggests the presence of more training in mental health problems but such conjecture awaits further study. Regional differences in the number of practicing psychiatrists per 1000 population over time may explain why anxiety-related visits were highest in the Northeast and lowest in the West.[10] The Northeast, with the highest rate of anxiety-related emergency department visits, had the lowest concentration of psychiatrists, with 5.1 per 1000 population.[10] However, the relevance of describing regional variations in health care has been questioned. Wennberg[43] has pointed out that small area variations are even larger than those occurring between states or large regions. Compared to other settings, the emergency department has a more balanced mix of anxiety-related visits between men and women. The fact that anxiety visits increased similarly in both men and women is of interest, as lower rates of treatment for mental disorders among men are consistently reported.[11,44]

The fact that increases in anxiety-related visits were most significant among the insured may reflect the impact of the introduction of managed behavioral health care. Of those National Comorbidity Surveys subjects with mental health disorders who had not sought care but perceived a need for it, 39% said that professional care was too expensive and 28% stated that their insurance would not cover it.[45]

Although the National Comorbidity Surveys detected a prevalence of mental health treatment in the U.S. population between 12.2% and 20.1%,[9] most patients are still untreated. Mental health care is increasingly outpatient, uncovered, and managed, leaving many to rely on the emergency department as their only guaranteed portal of access to mental health care.

We noted a sustained and significant national increase in the use of anxiolytic/hypnotic medications in the emergency department setting. This increase occurred against the backdrop of heightened awareness of anxiety-related conditions, U.S. Food and Drug Administration approval of several new drugs for anxiety disorders (e.g., alprazolam, paroxetine, and sertraline for panic; venlafaxine for generalized anxiety disorder; sertraline, paroxetine, and sustained-release venlafaxine for social phobia; fluvoxamine for obsessive-compulsive disorder; and sertraline and paroxetine for posttraumatic stress disorder), the initiation of aggressive direct-to-consumer and practitioner-targeted marketing of these agents, and the development of practice guidelines for the anxiety disorders.[46–48]

The large proportional increase in anxiety-related presentations to emergency departments took place in the age groups in which anxiety disorders have their initial onset, with a 100% increase among children younger than 15 years, a 23% increase among those aged 15 to 29 years, and a 58% increase among those aged 30 to 49 years. The development of emergency department–based approaches for detection and referral of anxiety disorders is important since there are effective evidence-based treatments for these disorders which could potentially prevent years of unnecessary suffering, functional impairment, and the development or exacerbation of comorbid medical and mental disorders. For example, a number of studies have shown that it is not uncommon for substance abuse disorders to develop after the onset of anxiety disorders, perhaps as a means to self-medicate debilitating symptoms of anxiety.[49,50] The possibilities for emergency department–based detection, prevention, and even treatment of mental disorders are increasingly under study. Swinson et al.[51] reported that a 1-hour session in which emergency department patients with panic attacks received exposure instruction without any other therapist contact was significantly more effective than reassurance in another patient group in lessening depression, agoraphobic avoidance, and panic attack frequency at 6-month follow-up. For some anxiety disorders, such as posttraumatic stress disorder, acute care settings may be virtually the only avenue through which potential preventative treatments may be studied and developed in order to permit intervention in the 1-month window between the trauma and the time at which the disorder manifests.

The increase in utilization of emergency departments for anxiety-related visits across the decade underscores the need for new models of collaboration between emergency health care and mental health.

Limitations

There are several limitations to this analysis. The NHAMCS data on mental health diagnoses are not obtained by psychiatric screening but through prospective collection by trained non–mental health personnel. Subdiagnostic distress can be difficult to differentiate from diagnosable illnesses. Some proportion of subthreshold cases and normal variants that exist are likely to have been characterized as anxiety-related visits. It is also a limitation of this work that the reliance on single visit codes precluded our ability to determine the frequency of repeat visitors. If there were visits from patients with other disorders but without an anxiety disorder who presented with an anxious diathesis, attribution of these visits to anxiety could have led to an overestimate of visits attributable to an anxiety disorder. However, given prior data, emergency personnel are far more likely, as a general rule, to undercount than overdiagnose mental health conditions.[52]

SUMMARY

Given that anxiety disorders tend to have an early onset, to have a chronic course when untreated, to predict the development of comorbid mental and substance abuse disorders, to be associated with substantial functional impairment, and to respond to evidence-based treatments, further research related to detection, prevention, and early effective treatment is of great importance.

The significant national increase in anxiety-related emergency department visits suggests the need for a new model of collaboration between psychiatrists and emergency physicians. The current emergency department model of psychiatrists as specialty consultants, while perhaps suitable for providing subspecialty care to mentally ill patients with persistently severe disorders (e.g., schizophrenia or bipolar patients), may not be optimal for improving the overall recognition and treatment of anxiety disorders. To improve early detection and treatment for an increasing number of patients presenting to emergency departments with anxiety disorders, it will also be important for mental health professionals to educate emergency department personnel about state-of-the-art screening, evaluation, and referral for treatment.

Drug names: alprazolam (Xanax, Niravam, and others), paroxetine (Paxil, Pexeva, and others), sertraline (Zoloft and others), venlafaxine (Effexor and others).

REFERENCES

1. U.S. Department of Health and Human Services. Mental Health: A Report of the Surgeon General. Center for Mental Health Services. Rockville, Md: US Department of Health and Human Services;1999
2. Mental Health Commission. Achieving the Promise: Transforming Mental Health Care in America. President's New Freedom Commission on Mental Health. Available at: http://www.mentalhealthcommission.gov/reports/FinalReport/toc.html. Accessed August 28, 2007
3. Fields WW, Asplin BR, Larkin GL, et al. The Emergency Medical Treatment and Labor Act as a federal health care safety net program. Acad Emerg Med 2001;8:1064–1069
4. Regier DA, Shapiro S, Kessler LG, et al. Epidemiology and health services resource allocation policy for alcohol, drug abuse, and mental disorders. Public Health Rep 1984;99:483–492
5. Institute of Medicine. The future of emergency care in the United States health system. Ann Emerg Med 2006;48:115–120
6. Wang PS, Demler O, Olfson M, et al. Changing profiles of service sectors used for mental health care in the United States. Am J Psychiatry 2006;163:1187–1198
7. Vega WA, Kolody B, Aguilar-Gaxiola S, et al. Gaps in service utilization by Mexican Americans with mental health problems. Am J Psychiatry 1999;156:928–934
8. Kessler RC, McGonangle KA, Zhao S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Study. Arch Gen Psychiatry 1994;51:8–19
9. Kessler RC, Demler O, Frank RG, et al. Prevalence and treatment of mental disorders, 1990 to 2003. N Engl J Med 2005;352:2515–2523
10. Larkin GL, Claassen CA, Emond JA, et al. Trends in U.S. emergency department visits for mental health conditions, 1992 to 2001. Psychiatr Serv 2005;56:671–677
11. Kessler RC, Chiu WT, Demler O, et al. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry 2005;62:617–627

12. Kessler RC, Berglund P, Demler O, et al. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry 2005;62:593–602
13. Marshall RD, Olfson M, Hellman F, et al. Comorbidity, impairment, and suicidality in subthreshold PTSD. Am J Psychiatry 2001;158: 1467–1473
14. Huffman JC, Pollac MH. Predicting panic disorder among patients with chest pain: an analysis of the literature. Psychosomatics 2003; 44:222–236
15. Merritt TC. Recognition and acute management of patients with panic attacks in the emergency department. Emerg Med Clin North Am 2000;18:289–300
16. Rice DP, Miller LS. Health economics and cost implications of anxiety and other mental disorders in the United States. Br J Psychiatry 1998;172(suppl 34):4–9
17. Karlson BW, Herlitz J, Pettersson P, et al. Patients admitted to the emergency room with symptoms indicative of acute myocardial infarction. J Intern Med 1991;230:251–258
18. Srinivasan K, Joseph W. A study of lifetime prevalence of anxiety and depressive disorders in patients presenting with chest pain to emergency medicine. Gen Hosp Psychiatry 2004;26:470–474
19. Katon W. Panic disorder: relationship to high medical utilization, unexplained physical symptoms, and medical costs. J Clin Psychiatry 1996;57(suppl 10):11–18; discussion 19–22
20. Katon W, Von Korff M, Lin E. Relationship of panic disorder to high medical utilization. Am J Med 1992;92:7S–11S
21. Simon GE, VonKorff M. Somatization and psychiatric disorder in the NIMH Epidemiologic Catchment Area study. Am J Psychiatry 1991;148: 1494–1500
22. McCaig LF, McLemore T. Plan and operation of the National Hospital Ambulatory Medical Care Survey: series 1: programs and collection procedures. Vital Health Stat 1 1994;34:1–78
23. Stussman BJ. National Hospital Ambulatory Medical Care Survey: 1994 emergency department summary. Adv Data 1996;(275):1–20
24. McCaig LF, Stussman BJ. National Hospital Ambulatory Medical Care Survey: 1996 emergency department summary. Adv Data 1997;(293): 1–20
25. Stussman BJ. National Hospital Ambulatory Medical Care Survey: 1995 emergency department summary. Adv Data 1997;(285):1–19
26. Nourjah P. National Hospital Ambulatory Medical Care Survey: 1997 emergency department summary. Adv Data 1999;(304):1–24
27. McCaig LF, Stussman BJ. National Hospital Ambulatory Medical Care Survey: 1998 emergency department summary. Adv Data 2000;(313): 1–23
28. Burt CW, McCaig LF. Trends in hospital emergency department utilization: United States, 1992–99. Vital Health Statistics 13 2001;150:1–34
29. McCaig LF, Ly N. National Hospital Ambulatory Medical Care Survey: 2000 emergency department summary. Adv Data 2002;(326):1–31
30. Public Health Service and Health Care Financing Administration. International Classification of Diseases, Ninth Revision, Clinical Modification. Washington, DC: Public Health Service; 1991
31. U.S. Census Bureau. Census UBot. 2004. Available at: www.census.gov. Accessed January 5, 2004
32. Hing E, Gousen S, Shimizu I, et al. Guide to using masked design variables to estimate standard errors in public use files of the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey. Inquiry 2003;40:401–415
33. McCaig LF. Using National Hospital Ambulatory Medical Care Survey (NHAMCS) data for injury analysis. Presented at the User's Data Conference; July 12–14, 2004; Washington, DC
34. Wittchen HU, Fehm L. Epidemiology and natural course of social fears and social phobia. Acta Psychiatr Scand Suppl 2003;417:4–18
35. Realini JP, Katerndahl DA. Factors affecting the threshold for seeking care: the Panic Attack Care-Seeking Threshold (PACT) Study. J Am Board Fam Pract 1993;6:215–223
36. Katerndahl DA, Realini JP. Where do panic attack sufferers seek care? J Fam Pract 1995;40:237–243
37. Wang PS, Berglund P, Olfson M, et al. Failure and delay in initial treatment contact after first onset of mental disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry 2005;62: 603–613
38. Claassen CA, Kashner MT, Gilfillan SK, et al. Psychiatric emergency service use after implementation of managed care in a public mental health system. Psychiatr Serv 2005;56:691–698
39. Kessler RC, Frank RG, Edlund M, et al. Differences in the use of psychiatric outpatient services between the United States and Canada. N Engl J Med 1997;336:551–557
40. Moorhead JC, Gallery ME, Hirshkorn C, et al. A study of the workforce in emergency medicine: 1999. Ann Emerg Med 2002;40:3–15
41. Haskins RJ, Kallail KJ. Staffing in small rural hospital emergency rooms: dependence on community family physicians. Fam Pract Res J 1994;14: 67–75
42. Haase CE, Lewis LM, Kao B. Do estimates of emergency physician workforce underestimate current needs? Ann Emerg Med 1996;28: 666–670
43. Wennberg JE. Understanding geographic variations in health care delivery. N Engl J Med 1990;340:52–53
44. Kessler RC, Zhoa S, Katz SJ, et al. Past-year use of outpatient services for psychiatric problems in the National Comorbidity Survey. Am J Psychiatry 1999;156:115–123
45. Mojtabai R, Olfson M, Mechanic D. Perceived need and help-seeking in adults with mood, anxiety, or substance use disorders. Arch Gen Psychiatry 2002;59:77–84
46. Rosenthal MB, Berndt ER, Donohue JM, et al. Promotion of prescription drugs to consumers. N Engl J Med 2002;346:498–505
47. Nikelly A. Drug advertisements and the medicalization of unipolar depression in women. Health Care Women Int 1995;16:229–242
48. Herxheimer A. Relationships between the pharmaceutical industry and patients' organizations. BMJ 2003;326:1208–1210
49. Zimmermann P, Wittchen HU, Hofler M, et al. Primary anxiety disorders and the development of subsequent alcohol use disorders: a 4-year community study of adolescents and young adults. Psychol Med 2003;33: 1211–1222
50. Jacobsen LK, Southwick SM, Kosten TR. Substance use disorders in patients with posttraumatic stress disorder: a review of the literature. Am J Psychiatry 2001;158:1184–1190
51. Swinson RP, Soulios C, Cox BJ, et al. Brief treatment of emergency room patients with panic attacks. Am J Psychiatry 1992;149:944–946
52. Claassen CA, Larkin GL. Occult suicidality in an emergency department population. Br J Psychiatry 2005;186:352–353

