RATES AND SEQUELAE OF THE COEXISTENCE OF SUBSTANCE USE AND OTHER PSYCHIATRIC DISORDERS

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ABSTRACT

Objectives: Despite a growing body of investigations documenting the coexistence of substance use and other psychiatric disorders in a variety of patient populations, no data about comorbidity in the inpatient mental health system in Alaska have been published in scientific journals, and only limited data exist nationwide about coexistence rates in public psychiatric hospitals. ***Method*:** A retrospective population based study was performed on the entire population of psychiatric patients hospitalized at Alaska Psychiatric Institute (API) between 1993 and 2001. To explore rates of comorbidity, 5,862 patients (who accrued 10,656 visits) were classified according to their diagnostic status; to explore clinical and socio-demographic difference between patients with and without coexisting disorder, univariate analyses were calculated. ***Results:*** The study revealed startlingly high rates of comorbidity that have been rising steadily since the early 1990's. In fact, comorbidity has become the rule, not the exception, among patients receiving services at API, with over 60% presenting with coexisting substance use symptoms. Complicating issues even further, these comorbid patients presented with more complex social and interpersonal circumstances, more complex clinical issues, different courses of treatment, and greater symptom complexity than psychiatric-only patients. ***Conclusions:*** 1.) Individual patient level - Providers for psychiatric inpatients must become more prepared to deal with coexisting substance abuse symptoms; policy makers must become more aware of the need for such patients to have smooth transitions from mental health to substance abuse treatment systems. 2.) Systemic-administrative level - Educators must better prepare providers to deal with this challenging clientele. *(Int J Circumpolar Health 2002; 61: 224-244)*

Key words: Comorbidity, Dual Diagnosis, MICA, Substance Use, Mental Health

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In recent years, increasing numbers of research investigations, beginning with the Epidemiological Catchment Area (ECA) studies funded by the National Institute of Mental Health (1) and the National Comorbidity Survey (2), have documented the coexistence of substance use and other psychiatric disorders in a variety of patient populations, including those receiving inpatient care in psychiatric hospitals, outpatient services at mental health public and private clinics, residential treatment in substance use facilities, out-

patient services in drug and alcohol treatment centers, and mental health or substance use services within correctional systems (3-7). This coexistence of substance use and other psychiatric disorders has been labeled in a variety of ways, including comorbidity, dual diagnosis, and MICA (for "mentally ill chemically addicted"). Despite its documented frequency of occurrence, comorbidity remains poorly understood and is frequently missed as a diagnosis by practicing mental health clinicians (8-10). The lack of awareness about or attention to the needs of patients with comorbid substance use and other psychiatric disorders is unfortunate as it can lead to inadequate care that does not fully address the complex nature of the clinical presentation of these patients. In fact, the failure to identify this clinically demanding and potentially high-cost clientele may help explain why these patients have notoriously poor treatment outcomes and difficulty receiving appropriate care (11-15).

The complexity in presentation of comorbid patients derives from their clinically intricate constellation of symptoms and the multifold nature of their treatment needs. Comorbid patients present a variety of challenges to their care providers and present with more difficulties than their noncomorbid peers. For example, they tend to have fewer and less adequate relationships and social support networks (16,17); have greater symptom severity and seek more treatment; report greater distress, more social problems, more trouble keeping jobs, and less satisfaction with family relationships (14,18); have unstable housing, employment, and income histories (17,19,20); place a greater economic burden on their families (21); incur high productivity losses, have elevated associated health care costs, and have stimulated high-cost comorbidity research (22); tend to be younger and less educated (23,24); are more likely to be male and White (25); are more likely to have legal or criminal problems (11,20,26); and have poorer overall functional skills (25,27).

Not surprisingly, given these challenges, comorbid patients often have more difficulty gaining access to treatment, a poorer course of treatment, less successful treatment outcomes, greater rates of hospitalization, poor medication compliance, faster relapse, higher rates of criminal and suicidal behavior, decreased treatment compliance, and higher treatment costs (17,19,20,25,28-30). Thus, many calls have been made for better screening and

earlier identification of comorbid patients to improve their treatment plans and prognoses (27). Further, calls have been made for specialized treatment services for this population (31,32). Nevertheless, and despite some improvements and innovations (33,34), specialized treatment services remain an exception (9), a reality that can result in comorbid patients receiving inappropriate treatment and poor aftercare.

In part, the dearth of specialized treatment services can be explained by a continued lack of awareness about comorbidity among policy makers and administrators. Only additional data about a variety of settings for all states in the United States will serve to break through this denial about the reality of coexisting disorders in all treatment settings and geographic regions. In an attempt to provide further data, the current study provides information about the rates and consequences of comorbidity among psychiatric inpatients for the only public psychiatric hospital in the Alaska. No previous data about comorbidity in the inpatient mental health system in Alaska have been reported. Further, only limited data exist nationwide about coexistence rates in public psychiatric hospitals. Thus, the data provided by this investigation fill a large gap in the literature about comorbidity, both in terms of its rates and sequellae, in psychiatric hospitals in North America. Additionally, the data will be used to discuss implications for treatment service planning on an individual-patient and systemic-administrative level.

METHOD

Participants

Analyses for this study were based on retrospective data for the entire patient population at Alaska Psychiatric Institute for the time period between January 1, 1993, and June 30, 2001. During this time, there were 10,656 admissions to the hospital, based upon the first and repeat admissions of 5,862 patients. Of these patients, 2,476 (42.2%) were women and 3,386 (57.8%) were men. Ethnic backgrounds were as follows: White, 3,508 (60.0%); Alaska Native, 1,522 (26.0%); African American, 322 (5.5%); Hispanic, 124 (2.1%); American Indian, 111 (1.9%); Asian American, 137 (2.3%), and Other, 123 (2.1%). Most were unemployed (2,347; 42.5%), followed by "Other" (2,164; 39.2%),

and employed full-time or part-time (1,011; 18.3%). Academic backgrounds included 2,077 individuals (38.2%) with a high-school diploma as the highest educational level, 2,042 (37.6%) with less than a high-school diploma, and 1,316 (24.2%) with more than a high-school education. Note that where totals do not add up to 5,862, the difference is due to missing data.

Measures

The variables utilized in the analyses of this study were derived from the electronic database of Alaska Psychiatric Institute (API). This database contains a wealth of information about each patient and admission to API. Specifically, the following variables are contained in the database for each admission (i.e., multiple records are available per patient for patients with multiple visits) and were utilized for the current study: admission date, discharge date, type of admission, type of prior treatment, type of referral, type of discharge, facility discharged to, age, gender, ethnicity, education, employment, average annual income, living situation at admission, living situation at discharge, veteran status, payment method, alcohol involvement at admission, drug involvement at admission, Axis I DSM diagnoses, and Axis II DSM diagnoses. Additional variables were calculated based on these data points in the database, such as length of stay, number of admissions per patient, and comorbidity (i.e., coexistence of substance use and other psychiatric disorder). Other information is available in the database but was not used in the current study (e.g., geographic location, referral source). The database contains patient information back to 1962; however, early records contain only select census-related variables. Demographic and clinical information began to be collected in the database in 1990, but was not entered consistently until 1993. Thus, the current investigation focused on data for the time period between January 1, 1993, and June 30, 2001. A total of 10,656 admissions were recorded in the database for that time period, based upon 5,862 patients (described in Participants above).

Procedures

Data contained in the API database are based on inter-

views with patients at admission and discharge, conducted by various clinicians trained for such purposes. Diagnostic information is based upon interviews by psychiatrists, who use the most current DSM manual. In the time period in question, diagnoses were based upon the DSM-III-R until 1994 and the DSM-IV thereafter (the original version and then the text-revision; 35-37). Diagnoses are made at admission and discharge; for purposes of this study, only discharge diagnoses were used to maximize the accuracy of correctly identifying comorbidity. Over-diagnosis of comorbidity may occur based on admissions diagnoses as individuals may, for example, arrive at the hospital intoxicated without having a diagnosable substance use disorder. This diagnostic dilemma is usually clarified by time of discharge. Thus, discharge diagnoses are the best way of accurately capturing (and not over-reporting) comorbidity. Interview data are entered into the database on an ongoing basis by information management staff and the database is cleaned, updated, and verified regularly.

Analyses

For purposes of the study, data for the time period between January 1, 1993 and June 30, 2001 were extracted. Three sets of analyses were conducted. A set of preliminary analyses was conducted to arrive at the cleanest and least error-prone definitions of comorbidity and noncomorbidity. The first set of main analyses explored census-related issues about comorbidity, such as rates of comorbidity across the years and similar issues. The second set of main analyses explored the sequellae of comorbidity, using the clinical and socio-demographic variables available about each patient.

Preliminary Analyses. Three preliminary data steps accomplished several goals. First, all 10,656 patient contacts during the time period in question were categorized as comorbid versus noncomorbid on several criteria. A patient contact was considered comorbid if the database showed both a substance use and a psychiatric diagnosis for the individual at discharge; a patient contact was considered noncomorbid and psychiatric only if the database showed no substance use disorder, but one (or more) other psychiatric disorder(s) (thus, such a patient contact may have had multiple diagnoses, but none substance use-related); finally, a patient contact was considered noncomorbid

and substance use only if the database showed only substance use-related diagnoses.

Second, for each patient the three most recent admissions were explored to assess the consistency in diagnosis across admissions. Specifically, for each patient, data analyses determined if the patient was consistently diagnosed as comorbid or noncomorbid psychiatric only or noncomorbid substance use-related only. Patients who were consistently diagnosed as comorbid were selected to represent the comorbid group in subsequent analyses (n=2,635). Patients who consistently received noncomorbid psychiatric only diagnoses were selected to represent the psychiatric only group in subsequent analyses (n=2,338). Records for all other patients (n=889), not utilized in the analyses that followed, were divided as follows: there were 337 patients who were consistently diagnosed as noncomorbid substance use-related only; there were 545 patients who were inconsistently diagnosed as either comorbid or noncomorbid psychiatric only; and there were 7 patients who were inconsistently diagnosed as noncomorbid psychiatric only or noncomorbid substance use-related only. These categorizing decision-making steps resulted in the cleanest possible categorization of each patient represented in the dataset for the time period in question. No patients were included who had any recent admissions in which conflicting diagnoses were given that could have resulted in the patient being miscategorized as comorbid, when actually noncomorbid, or vice versa.

Third, in the final preliminary data step, data were unduplicated for the entire 8 ˚ year period to allow for analyses at the patient-, rather than the admission level. Thus, whereas 10,656 admissions occurred in the time period, the second set of main analyses could be based on the most recent records (admissions) of the 5,862 patients who were responsible for these admissions. Thus, no duplicate patients are included in those analyses.

Rates of Comorbidity. These analyses were focused on establishing comorbidity rates at API across the years. They relied exclusively upon descriptive data analyses, such as calculating percentages of comorbid versus noncomorbid admissions across the years. These analyses were based upon all *admissions* during the time period in question.

Sequellae of Comorbidity. These analyses focused on assessing socio-demographic and clinical characteristics as well as course-of-treatment information about comorbid

versus noncomorbid patients. These analyses were based upon unduplicated admissions, that is, *unique patients* during the time period in question. These analyses focused strictly on the 4,973 patients who were identified in the preliminary data steps as consistently having been diagnosed as *either* comorbid (n=2,635) or noncomorbid psychiatric only (n=2,338). Thus, these analyses were based on very pure groups of patients to maximize accuracy in differentiation between groups. Although also a pure group, patients with consistent noncomorbid substance use-related only diagnoses were not included in the analyses, given the much smaller number of individuals represented in this group (n=337).

Two types of bivariate inferential analyses were calculated, depending on the nature of the dependent variables. The independent variable for these analyses was always comorbidity categorization (with two levels: *comorbid* versus *noncomorbid psychiatric only*). Data that resulted in categorical dependent variables (e.g., gender, ethnicity, veteran status) were analyzed using an overall chi-square analysis for the category, comparing comorbid to noncomorbid psychiatric only patients. Significance level was adjusted to .001 due to the large number of chi square analyses. Data that rendered continuous dependent variables (e.g., income, length of stay) were analyzed using *t*-tests, again comparing comorbid to noncomorbid psychiatric only patients.

RESULTS

Rates of Comorbidity

Analyses based on all admissions (10,656; duplicated counts of patients) since January 1, 1993 reveal a steady increase in comorbidity rates at the hospital. At the same time that comorbidity rates have increased, noncomorbidity rates for psychiatric-only disorders have decreased, whereas noncomorbidity rates for substance use-related-only disorders have remained relatively stable. The relative stability of the substance-use-only category suggests that changes in comorbidity rates are not due to more accurate or more likely diagnosis of substance use-related disorders over time. Comorbidity rates since 1993 indicate that comorbidity has become the rule rather than the ex-

ception at Alaska Psychiatric Institute. In 1993, psychiatric-only diagnoses were more prevalent, accounting for almost 54% of all diagnoses. Almost 40% of patients were comorbid and 7% presented with substance use only. By 1997, these proportions had reversed, with 44% of patients presenting with only psychiatric diagnoses, 49% with comorbid diagnoses, and 7% with substance use-related diagnoses only. By the year 2000, comorbid admissions made up 58% of all admissions, followed by 38% psychiatric-only diagnoses, and 4% substance use-related diagnoses only. All in all, about 62% of current admissions to API include a substance use diagnosis at discharge. Thus, significantly more comorbid patients utilize the services at API than psychiatric-only patients, making comorbidity the rule, not the exception. These data are shown graphically in Fig. 1.

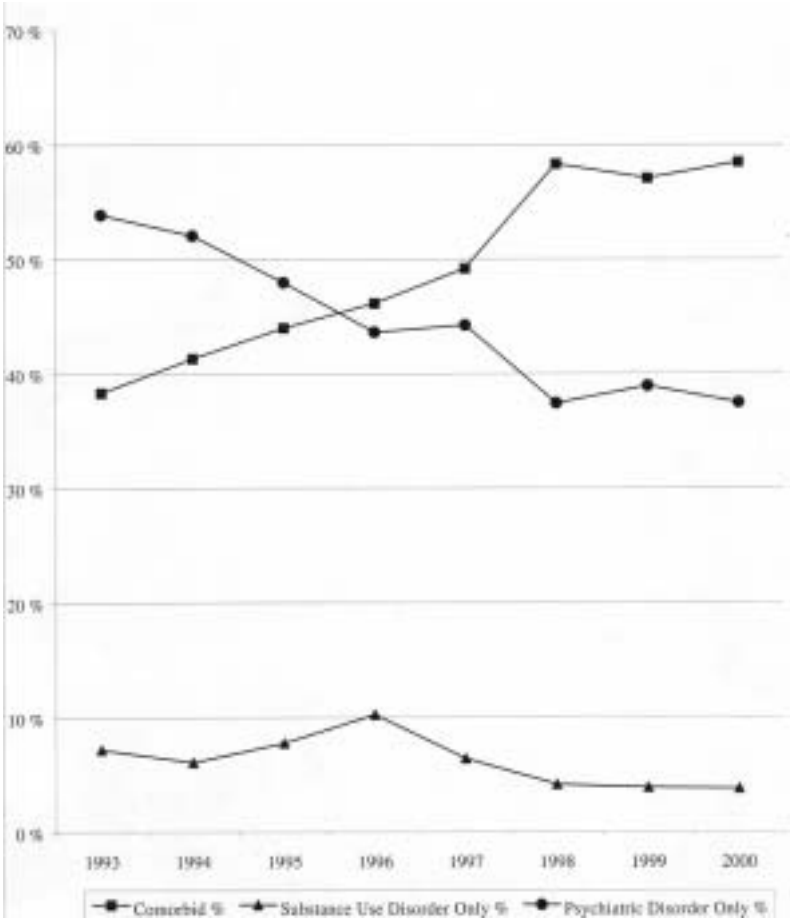

Fig. 1. Comorbid versus non-comorbid admissions to API.

Sequellae of Comorbidity

Analyses in this category were based only on patients with consistent comorbid (n=2,635) or consistent noncomorbid psychiatric only diagnoses (n=2,338). Thus, whereas the rates for comorbidity were established based on almost 11,000 admissions, sequellae were explored based upon the records (most recent admissions) of 4,973 unique patients. Analyses dealing with continuous dependent variables are presented in Table I; analyses dealing with categorical variables are shown in Table II. Table II presents findings in terms of total numbers and in terms of two types of percentages. First, percentages are calculated based on the number of patients within the target group (either comorbid or psychiatric-only) who fall into particular subcategories of a given variable; this is noted in the Table as Percent of Comorbid and Percent of Psychiatric. For example, with regard to Visits, the table reveals that of all comorbid patients 24.36% had only a single visit and 75.64 % had multiple visits. Second, percentages are calculated based on the percentage of comorbid versus psychiatric-only patients within a given category for all subvari-

Table I. Comparisons between Comorbid and Psychiatric-Only Patients.

Variable	Comorbid				Psychiatric Only					
	Central Tendency		Dispersion		Central Tendency		Dispersion		t-test Significance	
Treatment Variables:										
LOS	Mean	9.61	SD	18.69	Mean	17.35	SD	35.48	0.0001	C<P
	Median	4			Median	7				
	Mode	1			Mode	1				
Total Days in Hospital	Mean	27.88	SD	216.91	Mean	51.24	SD	272.79	0.0009	C<P
	Median	6			Median	10				
	Mode	1			Mode	1				
Number of Visits	Mean	1.74	SD	2.36	Mean	1.59	SD	1.79	0.01	C>P
	Median	1			Median	1				
	Mode	1			Mode	1				
Number of Visits for Those with > 1	Mean	4.03	SD	4	Mean	3.42	SD	2.93	0.002	C>P
Days Between Visits	Mean	257.52	SD	384.65	Mean	298.3	SD	433.74	0.005	C<P
Demographics:										
Age	Mean	32.43	SD	12.06	Mean	32.14	SD	15.42	0.46	C=P
Income ($)	Mean	8,561.56	SD	14,014.95	Mean	11,885.66	SD	16,294.9	0.0001	C<P
Clinical Characteristics:										
Number of Diagnoses	Mean	2.82	SD	0.39	Mean	1.97	SD	0.78	0.0001	C>P

Table II. Chi Square Analyses Comparing Comorbid and Psychiatric-Only Patients.

Variable	Comorbid			Psychiatric only		Comparison		
	Number	Percent of comorbid	Percent of variable	Number	Percent of psychiatric	Percent of variable	Overall significance	Difference
Total	2635	N/A	45.00	2338	N/A	39.90	0.001	C>P
Visits:								
Patients with a Single Visit	642	24.36	52.84	573	24.51	47.16	ns	C=P
Patients with Multiple Visits	1993	75.64	53.03	1765	75.49	46.97	ns	C=P
Gender:								
Female	978	37.12	45.15	1188	50.81	54.85	0.001	C<P
Male	1657	62.88	59.03	1150	49.19	40.97	0.001	C>P
Ethnicity:								
White	1549	59.03	51.47	1461	62.95	48.54	ns	C=P
Alaska Native	761	29.00	61.08	485	20.90	38.92	0.001	C>P
African American	127	4.84	48.85	133	5.73	51.15	ns	C=P
Hispanic	43	1.64	40.19	64	2.76	59.81	0.001	C<P
Native American	68	2.59	72.34	26	1.12	27.66	0.001	C>P
Asian American	32	1.22	25.40	94	4.05	74.60	0.001	C<P
Marital Status:								
Single	1357	53.45	51.87	1259	57.57	48.13	ns	
Married	393	15.48	48.70	414	18.93	51.30	ns	C=P
Separated	206	8.11	59.20	142	6.49	40.80	0.001	C>P
Divorced	517	20.36	61.62	322	14.72	38.38	0.001	C>P
Widowed	66	2.60	56.90	50	2.29	43.10	0.001	C>P
Educational Level:								
Less than High-School	919	37.15	52.25	840	39.55	47.75	ns	C=P
High-School	994	40.18	58.23	713	33.57	41.77	0.001	C>P
More than High-School	561	22.68	49.56	571	26.88	50.44	ns	C=P
Employment:								
Employed, part- or full-time	481	19.38	56.10	376	17.17	43.80	ns	C=P
Unemployed	1169	47.12	60.92	750	34.34	39.08	0.001	C>P
Student	326	13.14	39.23	505	23.12	60.77	0.001	C<P
Unable to Work	331	13.34	48.04	358	16.39	51.96	ns	C=P
Inmate in Correctional Facility	65	2.62	66.33	33	1.51	33.67	0.001	C>P
Homemaker	30	1.21	30.00	70	3.21	70.00	0.001	C<P
Living Arrangements:								
Alone/Independently	546	21.64	57.29	407	18.35	42.71	ns	C=P
With Family	900	35.67	49.15	931	41.97	50.85	ns	C=P
With Friends	358	14.19	64.27	199	8.97	35.73	0.001	C>P
In Foster Care	37	1.47	28.91	91	4.10	71.09	0.001	C<P
Board and Care Facility	58	2.30	40.85	84	3.79	59.15	0.001	C<P
Halfway House	14	0.55	63.64	8	0.36	36.36	0.001	C>P
Nursing/Intermediate Care Facility	3	0.12	15.00	17	0.77	85.00	0.001	C<P

Variable	Comorbid			Psychiatric only		Comparison		
	Number	Percent of comorbid	Percent of variable	Number	Percent of psychiatric	Percent of variable	Overall significance	Difference
Supervised Apartment	31	1.23	40.79	45	2.03	59.21	0.001	C<P
Crisis or Respite Care	20	0.79	32.26	42	1.89	64.74	0.001	C<P
General Hospital	14	0.55	38.89	22	0.99	61.11	0.001	C<P
Jail/Correctional Facility	158	6.26	59.40	108	4.87	40.60	0.001	C>P
Homeless/On Street	281	11.14	64.30	156	7.03	35.70	0.001	C>P
Other Psychiatric Hospital	18	0.71	42.86	24	1.08	57.14	0.001	C<P
Geographic Origin:								
Urban	1862	73.57	52.96	1654	74.71	47.01	ns	C=P
Rural	669	26.43	54.43	560	25.29	45.57	ns	C=P
Payment Source:								
Medicaid/Medicare	388	22.45	42.45	526	33.00	57.55	0.001	C<P
Champus/VA Benefits	137	7.93	54.15	116	7.28	45.85	ns	C=P
Insurance	270	15.63	41.22	385	24.15	58.78	0.001	C<P
Self-Pay	240	13.89	51.61	225	14.12	48.39	ns	C=P
Grant	693	40.10	66.96	342	21.46	33.04	0.001	C>P
Veteran Status:								
Pre-Vietnam	39	1.49	48.15	42	1.83	51.85	ns	C=P
Vietnam	147	5.63	70.67	61	2.66	29.33	0.001	C>P
Post-Vietnam	180	6.90	61.43	113	4.93	38.57	0.001	C>P
Non-Veteran	2195	84.13	52.34	1999	87.29	47.66	ns	C=P
Disability:								
Yes	394	21.47	52.25	360	21.90	47.75	ns	C=P
Substance Involvement at Admission:								
Drugs Only	264	10.22	80.49	64	2.83	19.51	0.001	C>P
Alcohol Only	596	23.07	89.36	71	3.14	10.64	0.001	C>P
Both Drugs and Alcohol	287	11.11	91.69	26	1.15	8.31	0.001	C>P
Neither Drugs Nor Alcohol	1436	55.59	40.61	2100	92.88	59.39	0.001	C<P
Psychiatric Diagnoses:								
Dementia	48	1.82	35.29	88	3.76	64.71	0.001	C<P
Bipolar Disorder	328	12.45	47.33	365	15.61	52.67	ns	C=P
Other Psychotic Disorder	194	7.36	50.13	193	8.25	49.87	ns	C=P
Schizophrenia	385	14.61	43.75	495	21.17	56.25	0.001	C<P
Depression	680	25.80	52.67	611	26.13	47.33	ns	C=P
PTSD	126	4.78	43.75	162	6.93	56.25	0.001	C<P
Adjustment Disorder	464	17.61	50.16	461	19.72	49.84	ns	C=P
Impulse Control Disorder	102	3.87	40.96	147	6.29	59.04	0.001	C<P
Conduct Disorder	154	5.84	36.84	264	11.29	63.16	0.001	C<P
Attention Deficit Disorder	33	1.25	21.02	124	5.30	78.98	0.001	C<P
V-Codes	142	5.39	36.50	247	10.56	63.50	0.001	C<P
Personality Disorder	506	19.20	54.47	423	18.09	45.53	ns	C=P

Variable	Comorbid			Psychiatric only		Comparison		
	Number	Percent of comorbid	Percent of variable	Number	Percent of psychiatric	Percent of variable	Overall significance	Difference
Number of Diagnoses at Discharge:								
One	0	0.00	0.00	760	32.50	100.00	n/a	n/a
Two	477	18.10	34.72	897	38.40	65.28	n/a	n/a
Three or More	2158	81.90	76.01	681	29.10	23.99	n/a	n/a
Psychiatric Medications:								
Yes	1646	63.16	55.7	1309	56.96	44.3	ns	C=P
Type of Admission:								
POA	1301	49.37	54.62	1081	46.24	45.38	ns	C=P
Ex Parte	498	18.90	49.85	501	21.43	50.15	ns	C=P
Court-Ordered Evaluation	151	5.73	61.38	95	4.06	38.62	0.001	C>P
Voluntary Adult	480	18.22	58.68	328	14.46	41.32	0.001	C>P
Voluntary Minor	114	4.33	32.66	235	10.05	67.34	0.001	C<P
Most Recent Prior Services:								
None	439	19.46	58.15	316	15.51	41.85	0.001	C>P
General Hospital	214	9.49	54.45	179	8.79	45.55	ns	C=P
API	176	7.80	59.26	121	5.94	40.74	0.001	C>P
Other Inpatient Mental Health	190	8.42	49.74	192	9.43	50.26	ns	C=P
Community Mental Health	619	27.44	49.56	630	30.93	50.44	ns	C=P
Private Mental Health	343	15.20	48.24	368	18.07	51.76	ns	C=P
Corrections	80	3.55	63.49	46	2.26	36.51	0.001	C>P
Referral Source:								
Self	138	5.25	63.89	78	3.36	36.11	0.001	C>P
Friends/Relatives	117	4.44	40.6	171	7.37	59.4	0.001	C<P
Legal System	830	31.57	53.04	735	31.66	46.96	ns	C=P
Outpatient Mental Health	406	15.45	47.6	447	19.25	52.4	ns	C=P
Inpatient Mental Health	63	2.39	44.06	80	3.45	55.94	0.001	C<P
Alcohol/Drug Treatment	16	0.61	94.12	1	0.04	5.88	0.001	C>P
General Hospital	979	37.25	58.87	684	29.45	41.13	0.001	C>P
Type of Discharge:								
Regular Discharge	2292	87.02	51.81	2132	91.19	48.19	ns	C=P
Against Medical Advice	282	10.71	66.22	144	6.16	33.80	0.001	C>P
Type of Referral:								
No Follow-up or Aftercare	187	7.31	63.18	109	4.84	36.82	0.001	C>P
Legal System	189	7.39	61.76	117	5.2	38.24	0.001	C>P
Outpatient Mental Health	1163	45.46	46.52	1337	59.4	53.48	0.001	C<P
Inpatient Mental Health	68	2.66	51.52	64	2.84	48.48	ns	C=P
Alcohol/Drug Treatment	239	9.34	98.35	4	0	1.65	0.001	C>P
General Hospital	360	14.07	65.34	191	8.49	34.66	0.001	C>P
Social Services	227	8.87	48.3	243	10.8	51.7	ns	C=P

Note: For variables where the columns under Percent Comorbid and the columns under Percent Psychiatric-Only do not add up to 100%, the remaining percent fall in the "Other" category, a catchall for variables with very low representation

Table III. Comparison of Comorbid and Psychiatric-Only Patients

Comorbid patients are under -represented in the following groups:	*Comorbid patients are over -represented in the following groups:*
• Female patients	• Male patients
• Hispanic patients	• Alaska Native patients
• Asian American patients	• Native American patients
	• Separated, divorced, or widowed patients
	• Patients with a high-school education
• Patients who are students	• Unemployed patients
• Patients who are homemakers	

• Patients who live in
  • foster care
  • board and care facility
  • a supervised apartment
  • a crisis or respite care facility
  • a general hospital
  • another psychiatric hospital
	• Patients who live
	  • in a halfway house
	  • in the street/are homeless
	  • in a correctional facility

• Patients with Medicaid or Medicare	• Patients with grant-funded hospital stays
• Patients with insurance	

	• Patients who are veterans
	  • of the Vietnam war
	  • of wars in the post-Vietnam era

• Patients who evidence neither recent alcohol nor recent drug use at admission	• Patients who evidence
	  • recent alcohol use at admission
	  • recent drug use at admission
	  • both recent alcohol and recent drug use at admission

• Patients diagnosed with
  • dementia
  • schizophrenia
  • PTSD
  • impulse control disorders
  • conduct disorders
  • attention deficit disorders
  • V-code diagnoses
	• Patients with more than the minimum number of diagnoses (i.e., more than one for psychiatric-only; more than two for comorbid)

• Patients admitted as voluntary minors	• Patients admitted
	  • as voluntary adults
	  • by court-order
	• Patients who had no prior services or who had prior services
	  • at API
	  • in a correctional facility

Comorbid patients are under -represented in the following groups:	*Comorbid patients are over -represented in the following groups:*

• Patients referred by
  • friends or relatives
  • inpatient mental health care providers
	• Patients referred by
	  • self
	  • alcohol/drug treatment providers
	  • general hospital staff

• Patients referred to
  • outpatient mental health services
	• Patients referred to
	  • no other services (no follow-up)
	  • corrections
	  • general hospitals
	  • drug or alcohol treatment

	• Patients discharged against medical advice
Comorbid patients are more likely to have	
• Less income	
• Shorter lengths of stay	
• Fewer total number of days in the hospital	
• Fewer days between last discharge and next admission	
• More visits to API	

ables; this is noted in the table as Percent of Variable. For example, for Visits, the table reveals that 52.84% of all patients with a single visit were comorbid and 47.16% were psychiatric only. Table III shows a summary of findings.

Course of Treatment. Analyses in this category imply that comorbid patients have a different course of treatment than noncomorbid patients with psychiatric disorders only. Specifically, comorbid patients have shorter lengths of stay and more admissions. Average length of stay for comorbid patients was about nine days as compared to over 17 days for psychiatric-only patients. Median length of stay was four days versus seven days; only modal length of stay was the same and was one day. With regard to total number of days spent in the hospital over the entire 8-year span, comorbid patients spent significantly fewer than psychiatric-only patients, with a mean of 27 versus 51 days and a median of six versus 10 days. However, comorbid patients had fewer days between visits, being rehospitalized within a mean of 257 days, as compared to psychiatric-only patients who returned within a mean of 298 days.

Comorbid patients averaged 1.74 visits or admissions, as compared to 1.59 visits for psychiatric-only patients, over the 8-year span in question. Median and modal numbers of visits was one, for both groups. The groups did not differ with regard to the proportion of patients with single versus multiple visits, with about a quarter of patients having single visits and three-quarters having multiple visits. The range of number of visits was quite disparate for the two groups, with up to 44 visits in the eight years for some comorbid patients and up to 28 for some psychiatric-only patients. Among comorbid patients with more than one visit, average number of visits was four, as compared to 3.4 visits for psychiatric-only patients with more than one visit. This difference reached statistical significance.

Socio-demographic Characteristics. Analyses in this category revealed that comorbid and psychiatric-only patients do not differ with regard to age. Average age for both groups was about 32 years. More comorbid patients are male than female. As compared to the psychiatric-only patient group, the comorbid patient group contains disproportionately higher percentages of Alaska Native and Native American individuals and disproportionately lower percentages of Hispanic and Asian American individuals, but equal numbers of White and African American individ-

uals. However, for both clinical groups the most common ethnic background was White, followed by Alaska Native and African American. Comorbid patients are more likely to be separated, divorced, or widowed as compared to psychiatric-only patients. The most common marital status for both groups was single, followed by divorced for the comorbid group and by married for the psychiatric-only group.

For all patients, the most common educational level was high-school, followed by less than high-school, and more than high-school. Comorbid and psychiatric-only patients did not differ significantly in terms of proportion of patients with less or more than high-school, but significantly more of those with exactly a high-school diploma were comorbid. For both psychiatric-only and comorbid patients being unemployed was the most common employment status, followed by employed or being students. The least common categories were homemaker, unable to work, and being an inmate in a correctional facility. Comorbid patients were more likely than psychiatric-patients to be inmates and to be unemployed; they were less likely to be students, homemakers, or employed. Commensurate with these findings, analyses also revealed that comorbid patients had less annual income than psychiatric-only patients, although the income level for both groups was very low, with an annual average of about $8,600 for comorbid and of about $12,000 for psychiatric-only patients.

The most common living arrangements for both comorbid and psychiatric-only patients was living with family, followed by living alone, living with friends, or being homeless. However, comorbid patients are more likely than psychiatric-only patients to live in correctional settings or in shelters and on the street; they are less likely to live in treatment-related settings. Comorbid and psychiatric-only patients do not differ in terms of geographic origin, being equally likely to come from rural or urban areas. In fact, in both groups about one-quarter of patients are from rural areas and three-quarters are from urban areas.

The most common means for paying for services for comorbid patients was by grant (state monies for patients unable to pay), followed by Medicaid/Medicare, insurance, and self-pay. For psychiatric-only patients the most common means of paying was Medicaid/Medicare, followed by insurance, grants, and self-pay. Comorbid patients were less likely than psychiatric-only patients to have third-party

payors and more likely to have to rely on grant mechanisms to pay for treatment.

Both groups were largely made up of non-veteran, followed by post-Vietnam, and Vietnam veteran status. Comorbid patients were overrepresented in the Vietnam and post-Vietnam veteran groups, as compared to psychiatric-only patients.

Clinical Characteristics. Analyses in this category reveal that the most common psychiatric diagnosis among comorbid patients is unipolar mood disorder, 25.8% of these patients having this diagnosis. The second most common psychiatric diagnosis is personality disorders, which applies to 19.2% of all comorbid patients. Adjustment disorders rank third and occur in 17.6% of patients; schizophrenia ranks fourth, being diagnosed in 14.6% of patients; bipolar mood disorders rank fifth and are diagnosed in 12.5% of patients. No other diagnostic group is represented by more than 7% of comorbid patients. The same "top five" diagnoses that coexisted with a substance use disorder among comorbid patients, also ranked among the top five for psychiatric-only patients, though in a different order. Specifically, unipolar mood disorders was diagnosed for 26.1%, followed by schizophrenia, diagnosed for 21.2% of patients. Ranked third was adjustment disorder, diagnosed for 19.7% of patients; personality disorders ranked fourth, diagnosed in 18.1% of patients; and bipolar mood disorder ranked fifth, diagnosed for 15.6%. Conduct disorders and V-codes ranked next, both with over 10% of patients thus diagnosed. In terms of proportions of comorbid versus psychiatric-only patients in the various diagnostic categories, analyses revealed that comorbid patients were underrepresented in the following groups of patients diagnosed with the following Axis I disorders: dementia, schizophrenia, PTSD, impulse control disorders, conduct disorders, attention-deficit disorders, and V-codes.

In terms of number of diagnoses, analyses revealed that more than 80% of comorbid patients had more than the minimum number of diagnoses (i.e., more than two diagnoses; one substance use, one psychiatric), as compared to 67% of psychiatric-only patients who had the minimum number (i.e., more than one psychiatric diagnosis). Fewer than 20% of comorbid patients had a single substance use and a single psychiatric diagnosis, as compared to over 32% of psychiatric-only patients who had a single diagnosis. With regard to substance involvement at admission,

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not surprisingly, comorbid patients are underrepresented in the group that has no evidence of recent use, but overrepresented in the groups of patients who evidence recent alcohol use, drug use, or both alcohol and drug use. In fact, over 50% of comorbid patients present with substance use symptoms as compared to fewer than 10% of psychiatric-only patients.

The most common type of admission to the hospital for both comorbid and psychiatric-only patients is involuntary, either by peace officer application (i.e., the patient is brought in by police) or by an ex parte admission (i.e., the patient is committed after a hearing by a judge). These two types of involuntary admissions make up more than half, in fact almost three-quarters of all admissions in both groups. Comorbid patients are somewhat more likely than psychiatric patients to be court-ordered into the hospital for evaluation. The same proportions of voluntary admissions are noted for both groups, though there are more comorbid adult and fewer comorbid adolescent admissions than psychiatric-only admissions.

Comorbid patients and psychiatric-only patients are equally likely to have had their most recent prior services in either a mental health, general health, or substance use treatment system. Among those who did have prior recent services, most received these services in community mental health settings, followed by private mental health settings, a pattern that was equally true for comorbid and psychiatric-only patients. The least likely prior services for both groups were received in a correctional facility. Comorbid patients were more likely than psychiatric-only patients to fall into this group. Comorbid patients were also slightly overrepresented in the group of patients who had received their most recent prior services at API itself, though for both comorbid and psychiatric-only patients this made up only roughly 8% and 6% respectively.

Comorbid and psychiatric-only patients differed somewhat with regard to who referred them to the hospital, though for all three groups outpatient mental health care providers, general hospitals, and the legal system were the most common referral sources. The order of these referral sources for comorbid patients was general hospitals, legal system, and outpatient mental health care providers; for psychiatric-only patients it was the legal system, general hospitals, and outpatient mental health care providers. The least common referral source for both groups was a

drug or alcohol treatment facility. Comorbid patients were more likely than psychiatric-only patients to have been referred by self, alcohol or drug treatment centers, or general hospitals; they were less likely to be referred by friends and relatives, and inpatient mental health care providers. Comorbid patients were more likely than psychiatric-only patient to be discharged against medical advice. However, both groups were most commonly discharged after treatment at the hospital was deemed complete (regular discharge).

With regard to referral targets, the typical arrangements were for outpatient mental health care. Second most common referral for psychiatric-only patients was for social service referrals, followed by referrals to general hospitals or the correctional system. Just fewer than 5% left without follow-up plans. The second most common referral for comorbid patients was to general hospitals, followed by referral for alcohol or drug treatment and referral for social services or to the legal system. As many as 7.3% left the hospital without aftercare arrangements. Proportionately, comorbid patients were more likely than psychiatric-only patients to leave the hospital without aftercare arrangements. They also were more likely to be discharged to the correctional system, a general hospital, or a substance abuse treatment facility. They were less likely than psychiatric-only patients to be discharged to outpatient mental health services.

DISCUSSION

The results from this study clearly support the hypothesis that the coexistence of substance use and other psychiatric disorders among inpatient mental health patients is the rule and not the exception at Alaska Psychiatric Institute. Well over half of all psychiatric patients seeking services at the Alaska Psychiatric Institute over the past eight years presented with both substance use and other psychiatric disorders. This proportion has been increasing steadily and currently over 60% of these mental health patients present with substance use disorders. These findings are important in and of themselves but have even more profound implications given additional findings about the socio-demographic and clinical characteristics of comorbid patients.

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Comorbid patients appear to have a different course of treatment. They have significantly shorter mean stays than psychiatric-only patients, staying an average of about nine days as compared to 17 days for the psychiatric-only patients. Median lengths of stay are also shorter, with four days versus seven days. They have more visits than psychiatric-only patients but a lesser total number of days in the hospital across the years. Thus, it appears that they are admitted more often and discharged more quickly. Their readmissions occur slightly more quickly than readmissions for psychiatric-only patients, generally occurring within about eight months as compared to within about 10 months for psychiatric-only patients.

With regard to socio-demographic characteristics, this study confirmed several prior findings as well. Specifically, comorbid patients are more likely to be male and divorced, separated, or widowed. They are more likely to be unemployed and have a significantly lower annual income than psychiatric-only patients. With regard to living situation, comorbid patients appear to have more difficult arrangements, being more likely to live with friends, be homeless, or claim the correctional systems as their most recent place of housing. On the other hand, they are less likely than psychiatric-only patients to claim their most recent residence to have been within a treatment setting (e.g., psychiatric hospital, respite care, supervised apartment). However, comorbid and psychiatric-only patients are equally likely to come from rural or urban areas. Comorbid patients are less likely than psychiatric-only patients to have a third-party payor for their hospital stay, having to rely more on state grants to fund their services. They are more likely to be Vietnam- or post-Vietnam veterans.

With regard to clinical characteristics, comorbid patients appear to present with greater symptom complexity. Specifically, they are extremely likely to present at admission with symptoms of recent substance use. In fact, 80% to 90% of all patients who present with symptoms of recent substance use when they present for admission are patients with formally diagnosed coexisting substance use disorders. Their symptom complexity is increased by the coexistence of psychiatric disorders. Most commonly, comorbid patients present with coexisting depression, personality disorder, adjustment disorder, schizophrenia, or bipolar disorders. All in all comorbid patients have more

diagnostic labels per patient than psychiatric-only patients. Comorbid patients are more likely to have been court-ordered for evaluation and more likely to have received their most prior recent services within the correctional system. These findings in combination with the living arrangement finding suggest that comorbid patients have more legal problems than psychiatric-only patients.

With regard to entry into and out of treatment, comorbid patients appear to present more challenges as well. They are less likely than psychiatric-only patients to have received prior services, perhaps for reasons of treatment non-availability, a common concern for comorbid patients (38). Comorbid patients are more likely than psychiatric-only patients to have been self-referred or referred by a general hospital or substance use treatment agency. Additionally, they are less likely than psychiatric-only patients to have been referred by friends or family, or by mental health treatment providers. Comorbid patients are more likely to leave treatment against medical advice and are more likely to leave without an aftercare plan in place.

These findings support the notion expressed by care providers for this clientele that comorbid patients present with particular difficulties that revolve around referral to treatment services and the management of difficult behaviors (39). They confirm that comorbid patients require special attention with regard to treatment planning and follow-up in that services must address a greater variety of symptoms and social concerns (40-42). Good comorbidly-attuned treatment plans must cover both symptoms of substance use and of the other psychiatric disorder (8,11,43). It is necessary to ensure that both types of disorders are covered in a long-term treatment plan in terms of planned interventions, desired outcomes, aftercare, and follow-up with appropriate emphasis on any acute and chronic safety concerns (34,44-46). Additionally, other social concerns that emerge for the comorbid patients must be dealt with effectively and planfully. Clearly, the current data suggest that issues such as financial concerns, employment, educational level, living arrangements, and involvement with the criminal justice system must be considered routinely with all comorbid patients (47,48).

To enable a hospital to deal effectively with patients who present with comorbid symptoms and all the sequellae such diagnosis implies, it must specifically be prepared to assess, diagnose, plan interventions, and implement

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ment treatment strategies for them. This ability relies upon sensitivity of the facility to the issue of comorbidity, adequate training of diagnostic staff to detect comorbidity when it is present, adequate training of treatment staff to make and implement complex treatment plans that consider psychiatric and substance use symptoms, and preparedness of social work staff to address the complexity of social issues that are likely to be involved in a comorbid patient's case. Finally, a hospital with a commitment to treating comorbid patients must be embedded in a service community that is equally sensitive to issues of comorbidity. Such sensitivity implies administrative integration of services, communication between mental health and substance use treatment agencies, and community-wide cross-training of care providers.

In summary, there is no doubt that the time has come for Alaska state governments, communities, hospitals, and treatment providers to recognize that they must plan services for patients who most likely will present with both substance use and mental health symptoms as these patients have become the majority in mental health and substance use treatment settings. Not doing so will continue to perpetuate less than optimal care for comorbid patients. Providers must become more attuned to the needs of psychiatric patients that have to do with substance use as well as with other social and legal issues that are of particular concern among groups of patients with coexisting disorders. The failure to provide comprehensive treatment is likely to perpetuate a course of treatment for patients with coexisting disorder that is more protracted, results in shorter and more frequent hospitalizations, and in the end is costly for the treatment systems. For providers to meet these objectives, educators must incorporate training regarding coexisting disorder into their curriculum. Similarly, policy makers must begin to facilitate seamless systems of care that cut across mental health and substance abuse treatment systems. Only with attention to service, training, and public policy will care for patients with coexisting disorders begin to become more appropriate to the needs of this special and numerous clientele.

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