

A Change in Perspective: From Dual Diagnosis to Multimorbidity

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Objective: There has been increasing interest within psychiatry in the concept of multimorbidity because psychiatric patients typically present with multiple concurrent disorders, these disorders mutually exacerbate one another, and their interaction shapes treatment options. Metrics have not been developed to document multimorbidity in psychiatric clinical practice.

Methods: Four classes of indicators relevant to multimorbidity were defined and evaluated among veterans treated in mental health specialty clinics nationally in the Veterans Health Administration (VHA) in fiscal year 2012.

Results: Of the 843,583 veterans with at least three visits to a specialty mental health clinic, 94.6% had more than one general medical or mental disorder and 77.6% had more than one mental disorder, compared with 30.6% with co-occurring psychiatric and substance use disorders.

Conclusions: Real-world psychiatric care is more accurately approached from the multimorbidity perspective than from the perspective of principal, dual, or comorbid diagnoses.

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During the decades of deinstitutionalization in the 1960s and 1970s, care for people with serious mental illness moved from the protective walls of the custodial asylum to neighborhoods and communities. As a result, young people with serious mental illness, initially referred to as “young chronics” (1), were exposed on a more regular basis to recreational drugs and alcohol used increasingly by young people in the larger society. The advent of the *DSM-III* in 1980 promoted an increasing clinical focus on identifying diagnoses (2). Accordingly, young people with serious mental illness and a substance use disorder came to be diagnosed as having a dual diagnosis, or co-occurring disorders. Prominent epidemiological studies (3), a specialty journal (4), and even a specialized consumer-operated self-help group (5) emerged to identify and address the complex problems of persons with co-occurring disorders.

The concept of co-occurring psychiatric and substance use disorders is now being subsumed under a new conceptualization of medical complexity, the notion of multimorbidity (6–8). The multimorbidity perspective is based on three core clinical observations: although most clinical trials are conducted on patients without comorbid conditions, most patients encountered in real-world practice present with multiple disorders; multimorbidities exacerbate one another and, in the case of behavioral health, lead to “multiple social dysfunctions”; and multimorbidities often require modifications of treatment plans because treatment for pure, isolated diagnoses may be ineffective, impractical, or risky in the context of multimorbidity (7,8). The concept of

multimorbidity has recently been suggested as a conceptual framework for psychiatry (6,9).

Thus far, limited data have been available to characterize the clinical epidemiology and prevalence of multimorbidity among people seeking help for psychiatric illness. Previous research has focused on comorbidity, or co-occurring pairs of diagnoses. Multimorbidity, in contrast, considers multiple psychiatric, addiction, and general medical diagnoses together as a whole (10). In this study, we identify a set of multimorbidity indicators derived from administrative data from the Veterans Health Administration (VHA). We present data on four classes of indicators among patients with at least three visits with a mental health provider, in order to characterize the prevalence of multimorbidity among patients typically seen in active treatment in specialty mental health clinics. The four indicators reflect direct and indirect indicators, psychotropic medication complexity, socioeconomic stressors, and general medical indicators.

METHODS

National VHA data from fiscal year 2012 included patients with any mental disorder based on *International Classification of Diseases*, ninth revision, (*ICD-9*) codes 290–319. Patients who had at least three mental health specialty clinic visits were included in order to represent psychiatrists' typical caseloads. Three visits were used as a somewhat arbitrary cutoff to identify patients actively involved in treatment, rather than just assessment.

Measures of multimorbidity were chosen among four domains. Direct indicators were based first on simple calculations of the total number of *ICD-9* identified psychiatric, substance use, and medical diagnoses out of a set of 10 psychiatric disorder clusters, seven substance use conditions, and 24 medical disorders. [A table listing the 10 psychiatric disorder clusters is available in an online supplement to this report.] Psychiatric diagnostic clusters include post-traumatic stress disorder (PTSD), anxiety disorders, major depressive disorder (MDD), other depressive disorders, bipolar disorder, schizophrenia, and personality disorders. Substance use disorders included dependence on or abuse of any one of seven substances: alcohol, cannabis, cocaine, opioids, sedatives/hypnotics/anxiolytics, amphetamines, and hallucinogens. General medical diagnoses were identified through *ICD-9* codes representing common serious chronic medical problems making up the Charlson Comorbidity Index (11), such as hypertension, diabetes mellitus, and chronic obstructive airway disease. These measures were used, in turn, to construct five direct indicators of multimorbidity: the average total number of medical diagnoses or mental disorders (psychiatric or substance use) per veteran, the average number of mental disorders per veteran, the proportion of patients with co-occurring disorders, the proportion with more than one mental disorder or medical diagnosis, and the proportion with more than one mental disorder.

Measures of psychotropic medication complexity include the total number of psychotropic prescription fills during the year for any of six classes of medication, including antidepressants, antipsychotics, benzodiazepines/sedatives/hypnotics, lithium, stimulants, and anticonvulsants/; lithium, stimulants, and anticonvulsants/mood stabilizers [see online supplement]; the average number of classes of psychotropic medications filled per patient; the proportion of patients given a prescription for more than three classes of psychotropic medications; and the proportion given a prescription for at least one opioid medication.

Socioeconomic measures included average income, the proportion with incomes less than \$7,000, the proportion with incomes less than \$25,000 (the poverty level for an individual income supporting a family of four), and the proportion with a history of recent homelessness, as indicated by receipt of services from a specialized Veterans Affairs (VA) or non-VA homeless service program or a V-60 *ICD-9* code.

The final set of indicators addressed general medical indicators, including the proportion with any pain diagnosis (12), obesity (body mass index >30), tobacco use disorder, or a diagnosis of insomnia.

Descriptive analyses were used to compare veterans with any psychiatric or substance use disorder or an index diagnosis of each of four frequent disorders (PTSD, MDD, schizophrenia, and alcohol use disorder), as well as to compare veterans with one diagnosis to those with more than one. For economy of presentation, index psychiatric diagnoses

were limited to PTSD, MDD, schizophrenia, and alcohol use disorders because of their relatively high frequency. These index diagnoses were examined to compare differences in multimorbidity indicators among these disorders. However, to be consistent with the multimorbidity paradigm, these index diagnoses were not taken to be the primary, principal, or most important diagnoses. Instead they were considered to be neutral tags with no intended priority over other presenting diagnoses or problems. No statistical tests were used because of the descriptive goals of the study. Additionally, because the sample is very large, statistical significance testing would not be meaningful, because small and clinically insignificant differences may have statistical significance.

The study was approved by the institutional review board committee of the VA Connecticut Healthcare System. A waiver of informed consent was obtained because the study used administrative data and there were no patient identifiers included. All analyses were conducted using SAS statistical software, version 9.2.

RESULTS

The sample included 843,583 veterans with a mental disorder and at least three mental health visits in fiscal year 2012. Among these, 405,592 (48.1%) were diagnosed as having a nonexclusive diagnosis of PTSD, 225,987 (26.8%) had MDD, 64,984 (7.7%) had schizophrenia, and 188,634 (22.4%) had alcohol use disorder (Table 1). The mean $\pm$ SD age of veterans in the sample was 54.2 ± 14.1 years; 89.7% ($N=756,693$) were men, 73.4% ($N=626,782$) were white, 22.0% ($N=185,588$) were black, and 16.0% ($N=134,973$) were Hispanic.

Among veterans with any mental disorder, 30.6% were diagnosed as having a co-occurring psychiatric and substance use disorder. By using the new model of multimorbidity, 77.6% were diagnosed as having more than one mental disorder, and each veteran had an average of 2.68 ± 1.52 mental disorders; 94.6% of veterans had more than one mental disorder or medical diagnosis and an average of 4.61 ± 2.27 total psychiatric or medical diagnoses.

On average, veterans received 17.31 ± 27.64 prescriptions from 1.79 ± 1.10 psychotropic medication classes. A total of 25.5% were prescribed medications from more than three classes, and 34.6% received an opioid prescription.

Socioeconomic measures were notable because 64.3% of veterans had incomes below the poverty line for a family of four and 14.8% were recently or currently homeless.

General medical indicators of multimorbidity showed 61.9% had a pain disorder, 45.0% were obese, and 27.0% had a tobacco use disorder. There was limited variation among the indicators for each of the index mental disorders, although there were some notable differences. Veterans with PTSD had a lower rate of past homelessness (9.8%) than those with other index diagnoses.

Among those with MDD, a higher proportion had more than one mental disorder (93.6%). Veterans with alcohol use

TABLE 1. Multimorbidity indicators among 843,583 veterans with at least three visits to a specialty mental health clinic, by index diagnosis and number of mental disorders

Multimorbidity indicator	Any mental disorder (N=843,583)		Posttraumatic stress disorder (N=405,592)		Major depressive disorder (N=225,987)		Schizophrenia (N=64,948)		Alcohol use disorder (N=188,634)		1 mental disorder (N=188,914)		>1 mental disorder (N=654,669)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Direct indicator														
Average N of mental disorders or medical diagnoses (M±SD)	4.61±2.27		4.92±2.30		5.48±2.35		4.60±2.63		5.85±2.49		2.74±1.51		5.15±2.16	
Average N of mental disorders (M±SD)	2.68±1.52		2.94±1.58		3.40±1.62		2.81±1.91		4.01±1.76		—		3.17±1.39	
Co-occurring disorders	257,877	30.6	110,918	27.3	67,325	29.8	20,701	31.9	187,277	99.3	—		245,929	37.6
>1 psychiatric or medical disorder	797,835	94.6	391,590	96.5	222,979	98.7	59,143	91.1	186,093	98.7	143,533	76.0	—	
>1 psychiatric disorder	654,669	77.6	341,909	84.3	211,458	93.6	45,201	69.6	181,717	96.3	—		—	
Psychotropic medication complexity														
N of psychotropic prescriptions (M±SD)	17.31±27.64		17.58±26.13		20.86±29.80		33.79±54.96		20.22±36.61		12.78±18.87		18.58±29.52	
N of classes of psychotropic medication prescriptions (M±SD)	1.79±1.10		1.88±1.08		2.03±1.04		2.27±1.09		1.77±1.17		1.47±1.06		1.88±1.10	
Prescribed >3 classes of psychotropic medications	215,194	25.5	110,856	27.3	70,878	31.4	27,363	42.1	49,798	26.4	31,499	16.7	183,695	28.1
Any opiate prescription	291,807	34.6	145,869	36.0	89,238	39.5	16,170	24.9	64,657	34.3	53,016	28.1	238,791	36.5
Socioeconomic stressor														
Average income (\$)	22,716	35,807	24,218	30,491	22,968	34,028	21,915	22,185	18,388	31,162	24,176	39,833	22,295	34,546
Income <\$7,000/year	197,466	23.4	67,017	16.5	48,795	21.6	11,763	18.1	59,430	31.5	42,616	22.6	154,850	23.7
Income <\$25,000/year	542,794	64.3	232,414	57.3	144,648	64.0	34,205	52.7	138,624	73.5	116,117	61.5	426,677	65.2
Homelessness	125,222	14.8	39,930	9.8	30,397	13.5	12,306	18.9	59,683	31.6	20,904	11.1	104,318	15.9
General medical indicator														
Pain	522,032	61.9	263,052	64.9	152,479	67.5	31,508	48.5	118,962	63.1	99,284	52.6	422,748	64.6
Body mass index >30	379,216	45.0	145,472	47.6	82,942	47.7	21,031	43.5	51,468	34.8	62,012	47.3	222,372	44.4
Tobacco use	227,591	27.0	99,315	24.5	59,367	26.3	24,453	37.7	86,538	45.9	37,487	19.8	190,104	29.0
Insomnia	79,872	9.5	42,202	10.4	23,503	10.4	2,731	4.2	18,643	9.9	11,588	6.1	68,284	10.4

disorders had the largest proportion with more than one mental disorder (96.3%), the largest number of mental disorders (4.01 ± 1.76), and the largest number of medical diagnoses and mental disorders (5.85 ± 2.49), compared to the other three index diagnosis groups. The group with alcohol use disorder also had the highest proportion of veterans with incomes under the poverty level (73.5%), homelessness (31.6%), and tobacco use (45.9%). This group had a somewhat lower proportion of obesity (34.8%) than did the other three groups of index diagnoses.

Veterans diagnosed as having schizophrenia were less likely to have pain disorders (48.5%) and insomnia disorders (4.2%) than those with other index diagnoses. Compared with veterans with one diagnosis, those with more than one diagnosis had substantial increases in all multimorbidity indicators (Table 1).

DISCUSSION

The landmark National Comorbidity Study Replication (NCS-R) showed that almost one-half of U.S. adults with a mental disorder had more than one diagnosis and one-quarter had three or more diagnoses (3). However, the NCS-R did not address multimorbidity as experienced by clinicians in real-world practice. The study presented here used national VHA data to present multiple indicators of multimorbidity among VHA service users participating in active treatment, as defined as three or more visits during the fiscal year at specialty mental health clinics across the country. The traditional category of co-occurring disorders identified a substantially lower proportion of the patients than were identified using the multimorbidity indicators, and most VHA patients with psychiatric diagnoses had multiple medical and psychiatric diagnoses. Not only did the veterans in our study frequently have direct and indirect indicators of multimorbidity, but they were also prescribed substantial numbers and several different classes of psychotropic medications, as well as opiates; they experienced considerable socioeconomic stress; and they presented with many indicators of medical risk that could interact with psychiatric treatment. It is especially notable that there was limited variation among veterans across the selected index diagnostic categories and that veterans with more than one mental disorder differed from others on all indicators.

Under the multimorbidity paradigm, the challenge emerges of identifying which of the array of disorders and social dysfunctions to focus on while treating patients in a clinical setting. One way of triaging may be to choose the disorder or problem that causes the most suffering or dysfunction, regardless of whether it is psychological distress, vocational disability, relationship conflict, or legal entanglement. Another is to determine whether a single disorder may be driving other problems. Other options are to pick the disorder for which we have the most robust evidence for efficacy of a particular treatment, that costs the patient the least, that takes the shortest amount of time to generate a

response, that is most feasible to implement, or that is most favored by the patient. Unfortunately, clinical guidelines, like clinical trials, are often based on studies that exclude comorbid conditions, offering minimal guidance to the real-world tapestry of multimorbidity (13).

The data presented here provide clear evidence from real-world practice that patients are most often more complex than can be captured by any single DSM diagnosis or pair of DSM diagnoses. This is not a new discovery for clinicians, but it is a reminder that focusing on a principal diagnosis may foster the narrowing of vision when applied to clinical practice. In his book *How Doctors Think*, Jerome Groopman identifies a tendency of physicians to cope with uncertainty by prematurely jumping to diagnostic conclusions based on internal “confirmation biases,” rather than by systematically weighing alternatives for assessment and treatment (14). The multimorbidity perspective reminds us that a shift from a monodiagnostic perspective to a multidimensional, multimorbidity perspective is one of the important challenges and opportunities we face. Billing and other administrative requirements of medical practice may require justification of a plan based on a simplified diagnostic classification, but this should be thought of as a preliminary sketch rather than a conclusive stopping point.

Several methodological limitations of this study deserve comment. The data presented here are based on available administrative VHA data of uncertain validity and do not address non-VA service use by veterans treated by VHA. Furthermore, this study used national VHA data where women and young people are underrepresented, which may limit the generalizability of our findings.

CONCLUSIONS

The data reviewed here show that patients receiving psychiatric specialty care are better understood from the multimorbidity perspective, which allows linkage with the medical mainstream while promoting a multifaceted perspective that widens rather than narrows the field of practice.

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REFERENCES

1. Pepper B, Kirshner MC, Ryglewicz H: The young adult chronic patient: overview of a population. *Hospital and Community Psychiatry* 32:463–469, 1981
2. Mayes R, Horwitz AV: DSM-III and the revolution in the classification of mental illness. *Journal of the History of the Behavioral Sciences* 41:249–267, 2005

3. Kessler RC, Chiu WT, Demler O, et al: Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry* 62:617–627, 2005
4. Buckley PF: Research and practice in substance abuse comorbidity. *Journal of Dual Diagnosis* 1:1–6, 2005
5. Vogel H: *Double Trouble in Recovery*. Center City, MN, Hazelden, 2010
6. North CS, Brown ES, Pollio DE: Expanded conceptualization of multimorbidity to encompass substance use disorders and other psychiatric illness. *Annals of Clinical Psychiatry* 28:182–188, 2016
7. Tinetti ME, Fried TR, Boyd CM: Designing health care for the most common chronic condition—multimorbidity. *JAMA* 307: 2493–2494, 2012
8. Boyd CM, Martin Fortin MD: Future of multimorbidity research: how should understanding of multimorbidity inform health system design? *Public Health Reviews* 33:451–474, 2011
9. Bhalla IP, Stefanovics EA, Rosenheck RA: Clinical epidemiology of single vs multiple substance use disorders: polysubstance use disorder. *Medical Care* 55:S24–S32, 2017
10. Ward M, Druss B: The epidemiology of diabetes in psychotic disorders. *Lancet Psychiatry* 2:431–451, 2015
11. Charlson ME, Pompei P, Ales KL, et al: A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *Journal of Chronic Diseases* 40:373–383, 1987
12. Barry DT, Sofuoglu M, Kerns RD, et al: Prevalence and correlates of co-prescribing psychotropic medications with long-term opioid use nationally in the Veterans Health Administration. *Psychiatry Research* 227:324–332, 2015
13. Uhlig K, Leff B, Kent D, et al: A framework for crafting clinical practice guidelines that are relevant to the care and management of people with multimorbidity. *Journal of General Internal Medicine* 29:670–679, 2014
14. Groopman J: *How Doctors Think*. New York, Houghton Mifflin Harcourt, 2008

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