

It is illegal to post this copyrighted PDF on any website.

Disability and Functioning of Patients Who Use Psychiatric Hospital Emergency Services

Kevin D. Shield, MHSc^{a,b,*}; Paul Kurdyak, MD, PhD^{a,c}; Paul A. Shuper, PhD^{a,d}; and Jürgen Rehm, PhD^{a,b,d,e,f}

ABSTRACT

Objective: First, to compare the level of disability and functioning of patients who access psychiatric emergency services by diagnosis and service use frequency. Second, to compare patients who access psychiatric emergency services to the general population in terms of demographics and the level of disability and functioning.

Methods: Data from 420 patients were obtained by time-based sampling from August 2011 to February 2012 in the emergency department of a psychiatric hospital that provides services to adolescents and adults. The 2011 and 2012 Centre for Addiction and Mental Health Monitor surveys were used as a representative adult general population sample. Disability and functioning were measured using the World Health Organization Disability Assessment Schedule (WHODAS).

Results: Variation in WHODAS scores among psychiatric emergency patients was observed within but not between diagnostic categories and within frequency of use of these services categories. Psychiatric emergency patients had a mean WHODAS score of 38.0, significantly higher ($P < .001$) than the mean score of 5.0 for the general population; however, there was overlap in the distribution of WHODAS scores. Compared to the general population, psychiatric emergency patients were more likely to be men, younger in age, never married, and unemployed or a student.

Conclusions: Psychiatric emergency patients are demographically different when compared to the general population. Furthermore, since disability and functioning are highly variable within but not between psychiatric diagnostic categories, data on disability and functioning should be collected for psychiatric emergency patients, in addition to diagnosis data, to more accurately align patients with the appropriate intensity of services.

J Clin Psychiatry 2016;77(10):e1278–e1286
dx.doi.org/10.4088/JCP.15m10082

© Copyright 2016 Physicians Postgraduate Press, Inc.

^aCentre for Addiction and Mental Health, Toronto, Canada

^bInstitutes of Medical Science and ^cClinical Evaluative Sciences, ^dDalla Lana School of Public Health, and

^eDepartment of Psychiatry, Faculty of Medicine, University of Toronto, Canada

^fInstitute of Clinical Psychology and Psychotherapy, Technische Universität, Dresden, Germany

*Corresponding author: Kevin D. Shield, MHSc, CAMH, 33 Russell St, Toronto, Ontario, Canada M5S 2S1 (Kevin.david.shield@gmail.com).

Mental and behavioral disorders are highly prevalent,^{1,2} with the prevalence of these disorders being typically higher in the general population than is observed for other classes of chronic conditions.³ Furthermore, the burden of mental and behavioral disorders in terms of morbidity and total burden of disease (ie, disability-adjusted life-years lost) is high, with the global burden of these disorders being higher than the global burden of HIV/AIDS, tuberculosis, diabetes, or transport injuries.^{4–6} Thus, the treatment of these disorders should be a global health priority.⁷ However, treatment rates of mental and behavioral disorders are fairly low, ranging from 69% for schizophrenia to 24% for substance use disorders.^{8–10} Moreover, patients with mental and behavioral disorders often use costly emergency departments due to barriers to accessing mental health or addiction treatment.^{11–13}

Diagnoses were developed and have evolved over time to inform prognosis and to align patients with treatments specific to their diagnosis.^{14,15} For example, patients with psychotic disorders are prescribed an antipsychotic, and patients with mood/anxiety disorders are prescribed an anxiolytic, an antidepressant, or both. In addition to diagnosis, disability and functioning should be important measures for determining the appropriate intensity of diagnostically specific treatments, and thus, it is imperative to assess whether there are differences in disability and in functioning (both measured by the World Health Organization Disability Assessment Schedule version 2.0 [WHODAS 2.0]) among and between the diagnostic categories of alcohol use problems, drug problems, and mental health problems.¹⁶ In this context (ie, the biopsychosocial model), disability and functioning are “viewed as outcomes of interactions between health conditions (diseases, disorders, and injuries) and contextual factors,” where *disability* is an “umbrella term for impairments, activity limitations, and participation restrictions,” and *functioning* refers to “all body functions, activities, and participation.”^{17(p2)} The level of disability and functioning can be inferred in the criteria outlined in the *DSM-5*, but the determination of disability and functioning within this framework is not well standardized.¹⁵ The impact of the symptoms¹⁵ by diagnostic category on a person’s disability and functioning suggests that, on average, diseases such as schizophrenia have a higher impact on a person’s disability functioning (as measured by the WHODAS) than does bipolar disorder, which in turn has a higher average impact on a person’s disability and functioning than does major depressive disorder,¹⁸ with a study¹⁸ finding differences in disability by broad mental and behavioral diagnostic categories. Accordingly, we hypothesized that levels of disability and functioning would differ by diagnosis. Thus, an investigation of the differences in disability and functioning by more precise diagnostic categories (when compared to Sanderson and Andrews¹⁸) is warranted to determine whether differences exist within these broad categories (such as disability and functioning among patients with schizophrenia as compared to disability and functioning among patients with mood [affective] disorders). Furthermore, this analysis will provide an opportunity to expound on the relative merits of using level of disability and functioning in addition to diagnosis to screen and triage a

- It is currently unknown whether disability and functioning of patients in psychiatric emergency departments differ by psychiatric diagnosis and by frequency of psychiatric emergency department use.
- The implementation of the World Health Organization Disability Assessment Schedule as a clinical tool in psychiatric emergency departments may aid in triaging patients and aligning them with the appropriate intensity of care and resources.
- Future research is needed to determine which factors other than disability and functioning affect frequency of use of psychiatric emergency departments to ensure that patients are receiving adequate psychiatric care.

sample of individuals in order to align them with appropriate resource intensities.

Patients who frequent psychiatric emergency services are a heterogeneous group of patients with multiple health care needs.^{19,20} A systematic review²¹ found that frequent emergency department users tend to be sicker (they have a higher number of comorbidities and hospital admissions and have higher triage priority) than nonfrequent emergency department users. However, the studies included in the systematic review have not examined the level of disability and functioning of frequent and nonfrequent psychiatric emergency department users. Therefore, an examination of the disability and functioning of patients who access emergency psychiatric services by frequency of use is warranted.

Given the gaps in the current literature, one objective of this article is to present an assessment of the level of disability and functioning by diagnosis of patients who present at psychiatric emergency services. Also, this study aimed to assess differences in disability and functioning by frequency of psychiatric emergency services use. Finally, this study assessed differences in patients who access psychiatric emergency services compared to a general population in terms of demographics and the level of disability and functioning.

METHODS

Psychiatric Emergency Services Sample

Data were collected on patients at least 17 years of age who presented at the Centre for Addiction and Mental Health (CAMH), Toronto, Canada, psychiatric emergency department from August 2011 to February 2012. Patients were recruited using time-based sampling, with the sampling based on the number of patients who usually visit the emergency departments by hour over a 24-hour period. Trained interviewers along with a staff psychiatrist approached potential participants. If a potential participant was deemed not sufficiently psychologically stable to be interviewed by a staff psychiatrist in the emergency department, the individual was contacted later at the crisis clinic.

Using patients' medical record numbers, we matched our survey data to 2011 and 2012 data from the CAMH psychiatric emergency services database. From this database, we obtained for each patient the 4-digit ICD-10 code diagnosis (as specified by the psychiatrist who saw the patient in emergency care) that was the primary reason for any visit within 1 year of recruitment (6 months [188 days or half a year] before and 6 months after recruitment). Co-occurring diagnoses were not recorded for individuals (only the primary reason/diagnosis for any visit was recorded). Diagnoses were further categorized into 6 groupings as follows: mental and behavioral disorders due to psychoactive substance use (ICD-10 codes F10–F19); schizophrenia, schizotypal, and delusional disorders (F20–29); mood (affective) disorders (F30–F39); neurotic, stress-related, and somatoform disorders (F40–F48); disorders of adult personality and behavior (F60–F69); and all other diagnoses. Statistics for diagnosis code groupings other than those presented above were not possible due to sample size limitations. Disability and functioning were examined by frequency of CAMH psychiatric emergency services use. To be consistent with previous studies, we defined *frequent use* as 5 or more visits within a 1-year period (6 months before and 6 months after recruitment).²¹

General Population Comparison Sample

The 2011 and 2012 CAMH Monitors^{22,23} were used as the general population comparator group. The 2011 and 2012 CAMH Monitors were a county-stratified, 2-stage (telephone household, respondent) probability sampling of adults (18 years and older) from the province of Ontario, Canada, performed between January 2011 and December 2012, and had response rates of 51% for 2011 and 51% for 2012. The surveys were conducted using random-digit-dialing methods and computer-assisted telephone interviewing. A posteriori population expansion weights were calculated for the CAMH Monitors by triangulating survey data with census information on age and gender.

Measures

Demographics. The CAMH psychiatric emergency services data set and CAMH Monitors data set contained information on diverse sociodemographic variables, including gender, age, marital status, and current employment status (all such information was also asked to be provided by participants in our study).

Measures of disability and functioning. The WHODAS 2.0 is a general measure of functioning and disability in the following major life domains: cognition, mobility, self-care, getting along, life activities, and participation in society.²⁴ The WHODAS score ranges from 0 to 100, with 0 representing no disability and perfect functioning and 100 representing an extreme disability and decreased functioning. The psychiatric emergency patient sample was assessed using the 36-item WHODAS version 2.0, while the CAMH Monitors used the 12-item inventory. The 12-item WHODAS explains 81% of the variance of the 36-item WHODAS.¹⁶

It is illegal to post this copyrighted PDF on any website.

Table 1. Demographics of the General Population and of Patients Who Accessed Psychiatric Emergency Services by Diagnosis and Frequency of Use

Emergency and Ambulatory Psychiatric Services Sample																				
Variable	All (n=420)		F10–F19 ^a (n=92)		F20–F29 ^a (n=85)		F30–F39 ^a (n=234)		F40–F48 ^a (n=70)		F60–F69 ^a (n=20)		All Other Diagnoses (n=23)		Frequent Users (≥ 5 visits in 1 y) (n=46)		Nonfrequent Users (5 visits in 1 y) (n=374)		General Population Survey (n=3,662) ^{b,c}	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Gender																				
Men	53.1	223	66.3	61	51.8	44	48.7	114	42.9	30	30.0	6	52.2	12	47.8	22	53.7	201	47.9	1,465
Women	46.7	196	33.7	31	48.2	41	50.9	119	57.1	40	70.0	14	47.8	11	52.2	24	46.0	172	52.1	2,197
Transgender ^d	0.2	1	...	...	...	...	0.4	1	...	...	...	...	...	...	...	...	0.3	1	...	...
Age, y																				
17–24	26.2	110	17.4	16	23.5	20	26.5	62	34.3	24	55.0	11	17.4	4	23.9	11	26.5	99	11.9	171
25–34	22.4	94	28.3	26	17.6	15	23.5	55	22.9	16	25.0	5	26.1	6	21.7	10	22.5	84	15.5	382
35–44	21.2	89	25.0	23	23.5	20	20.9	49	15.7	11	15.0	3	13.0	3	21.7	10	21.1	79	21.1	602
45–54	18.6	78	19.6	18	22.4	19	16.2	38	22.9	16	...	...	30.4	7	19.6	9	18.4	69	18.5	763
55–64	8.6	36	9.8	9	8.2	7	9.0	21	4.3	3	5.0	1	13.0	3	13.0	6	8.0	30	16.8	792
≥65	3.1	13	...	...	4.7	4	3.8	9	...	...	...	...	...	...	...	...	3.5	13	16.1	952
Marital status																				
Currently married	13.6	57	13.0	12	4.7	4	17.5	41	10.0	7	10.0	2	4.3	1	8.7	4	14.2	53	59.9	2,069
Cohabiting	7.1	30	12.0	11	8.2	7	6.4	15	2.9	2	5.0	1	13.0	3	6.5	3	7.2	27	7.1	250
Previously married	7.6	32	7.6	7	4.7	4	8.1	19	7.1	5	5.0	1	8.7	2	4.3	2	8.0	30	10.4	774
Never married	71.4	300	67.4	62	82.4	70	67.5	158	80.0	56	80.0	16	73.9	17	80.4	37	70.3	263	22.3	554
Missing	0.2	1	...	...	...	...	0.4	1	...	...	...	...	...	...	...	...	0.3	1	0.2	15
Employment status																				
Paid work	24.3	102	21.7	20	14.1	12	25.2	59	30.0	21	20.0	4	26.1	6	6.5	3	26.5	99	59.9	1,963
Self-employed	3.8	16	7.6	7	2.4	2	3.0	7	4.3	3	...	...	...	...	4.3	2	3.7	14	4.8	169
Student	12.1	51	4.3	4	7.1	6	15.4	36	18.6	13	20.0	4	4.3	1	6.5	3	12.8	48	7.5	124
Keeping house/ homemaker	1.0	4	...	...	1.2	1	1.3	3	...	...	...	...	...	...	...	...	1.1	4	3.7	144
Retired	3.3	14	3.3	3	2.4	2	3.8	9	...	...	...	...	...	...	...	...	3.7	14	17.9	1,039
Unemployed	41.0	172	46.7	43	56.5	48	38.5	90	35.7	25	40.0	8	56.5	13	63.0	29	38.2	143	3.6	102
Other	14.3	60	16.3	15	16.5	14	12.4	29	10.0	7	20.0	4	13.0	3	19.6	9	13.6	51	2.6	119
Missing	0.2	1	...	...	...	...	0.4	1	...	...	...	...	...	...	...	...	0.3	1	0.0	2
No. of visits (1 y), mean	2.2		3.0		3.4		2.3		3.1		4.5		4.3		7.4		1.6		...	...

^aICD-10 codes: F10–F19 (mental and behavioral disorders due to psychoactive substance use), F20–29 (schizophrenia, schizotypal, and delusional disorders), F30–F39 (mood [affective] disorders), F40–F48 (neurotic, stress-related, and somatoform disorders), F60–F69 (disorders of adult personality and behavior).

^bParticipants of the general population survey were 18 years of age and older.

^cThe number of individuals surveyed is represented by n, and the percentages are population weighted to correct for sampling biases.

^dThe general population survey did not contain transgender as a response category.

Statistical Analyses

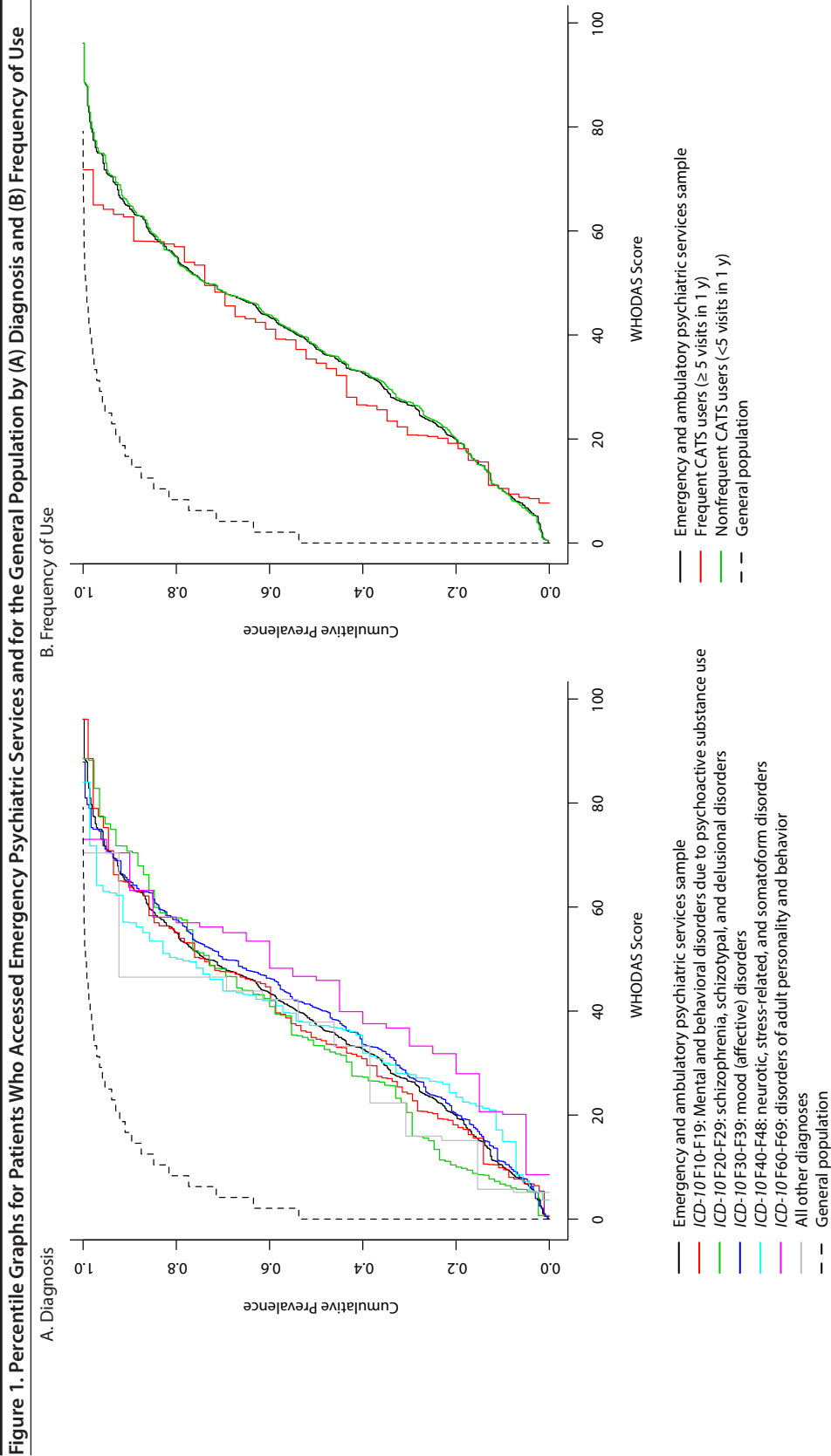
Comparisons were performed using quasi-Poisson regressions adjusted for age and gender.²⁵ As a person could have more than 1 diagnosis, differences in WHODAS scores were assessed by using a specific diagnosis group as the dependent variable and the WHODAS score, age, gender, and other psychiatric diagnoses as independent variables. This regression methodology corrects only for co-occurring psychiatric diagnoses that were recorded as the primary reason for other visits to the CAMH emergency departments and does not correct for co-occurring psychiatric diagnoses that were not recorded as the primary reason for other visits to the CAMH emergency departments. When multiple tests were required for a hypothesis, a Bonferroni correction was employed. To check for effect modification, the differences in the WHODAS scores among individuals who presented at psychiatric emergency services as compared to the general population were examined by gender. All analyses that included the CAMH Monitors 2011 and 2012 accounted for the complex survey design. All analyses were performed using R version 3.1.2²⁶ and the R software package survey.²⁷

RESULTS

A total of 468 patients completed the interview, representing 15.4% of all patients who visited the CAMH psychiatric emergency services during the study period. A total of 12 patients had their interview stopped, as they became psychologically unstable. Data on all variables were available for 450 participants. Of the 450 participants, 6.7% were not located within the CAMH emergency department database and, thus, did not receive a diagnosis and were excluded from the analyses, resulting in a total sample size of 420 participants.

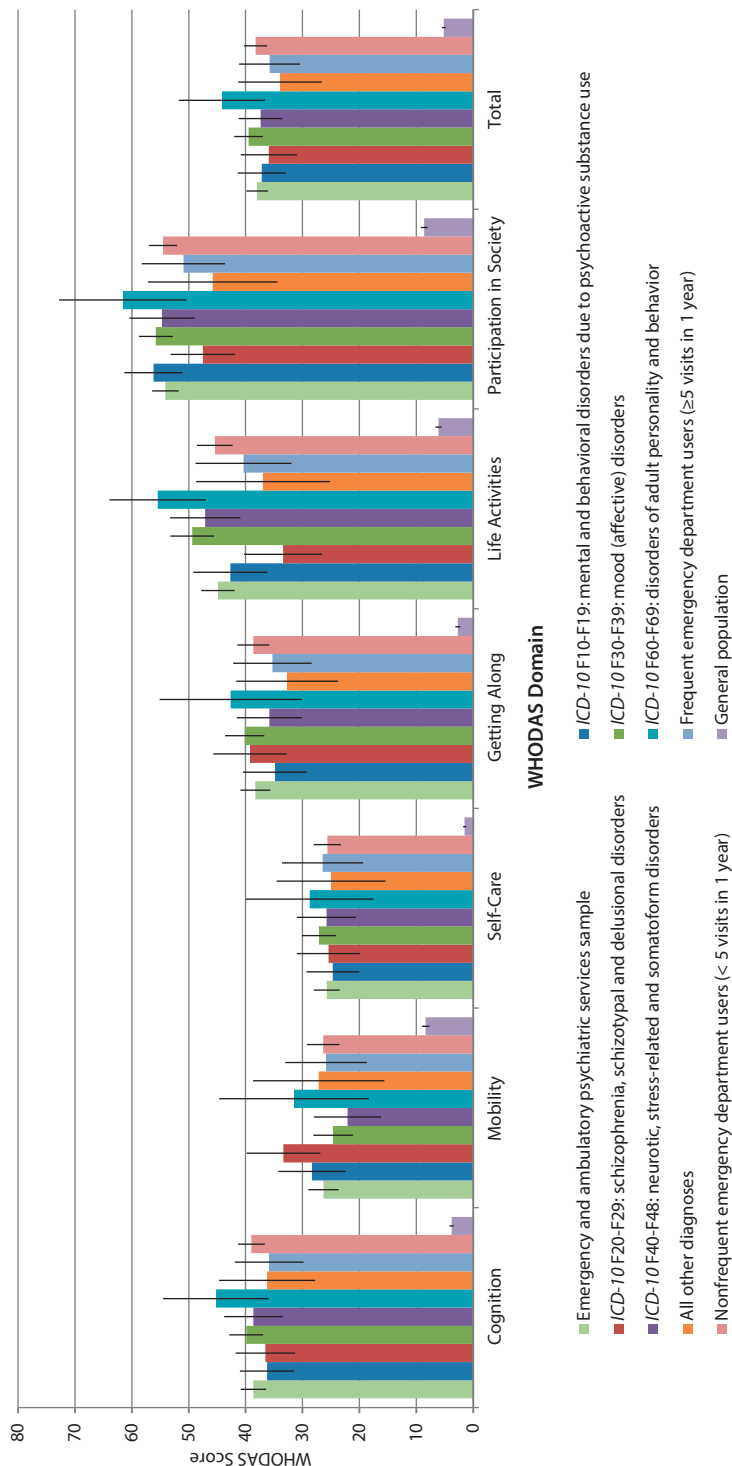
Psychiatric Emergency Services Sample Characteristics

Among the 420 study participants who presented at psychiatric emergency services, 53.1% were men, 46.7% were women, and 0.2% were transgender. The mean age of study participants was 36.7 years, the majority (71.4%) of study participants were never married, and 41.0% were unemployed (Table 1). Furthermore, 21.9% of participants presented to the CAMH emergency departments for psychoactive substance



It is illegal to post this copyrighted PDF on any website.

Figure 2. World Health Organization Disability Assessment Schedule (WHODAS) Domain Scores for Patients Who Accessed Psychiatric Emergency Department Services (by diagnosis and frequency of use of psychiatric emergency services) Compared to the General Population^a



^aError bars represent 95% CIs.

use; 20.2% for schizophrenia, schizotypal, and/or a delusional disorder; 55.7% for a mood (affective) disorder; 16.7% for neurotic, stress-related, and somatoform disorders; 4.8% for a disorder of adult personality and/or behavior; and 5.5% for another cause. Additionally, 11.0% of all participants who presented at psychiatric emergency services were frequent users of these services (≥ 5 visits in the year surrounding their survey measurement visit). Among those individuals who were frequent users, 32.6% sought help for disorders in only 1 diagnostic category, while 39.1%, 23.9%, and 4.3% sought help for multiple disorders covering 2, 3, and 4 diagnostic categories, respectively.

Disability and Functioning by Diagnostic Category in the Psychiatric Emergency Services Sample

The mean WHODAS score for participants who accessed psychiatric emergency services was 38.0 (95% CI, 36.1–39.9) using the 36-item WHODAS 2.0. Figure 1 outlines the distribution of WHODAS scores for the psychiatric emergency services sample and for the general adult population. When the WHODAS scores of participants who accessed psychiatric emergency services by diagnostic categories (adjusting for age, gender, and other diagnoses) were compared, no significant differences were observed among diagnostic categories (controlling for age, gender, and the presence of another diagnosis); however, variation in WHODAS scores within diagnostic categories was observed. Figure 2 outlines the WHODAS domain scores for the psychiatric emergency services sample and for the general population by diagnostic category and frequency of use of psychiatric emergency services. As with the total WHODAS score, no significant differences were observed when the domain scores of the WHODAS were compared by diagnostic category.

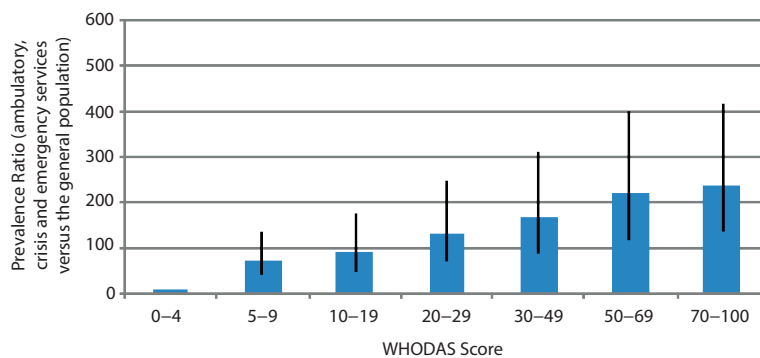
Disability and Functioning by Frequency of Psychiatric Emergency Services Use

When the patients were compared by frequency of psychiatric emergency services use, no significant differences were observed in the overall WHODAS scores or WHODAS domain scores of

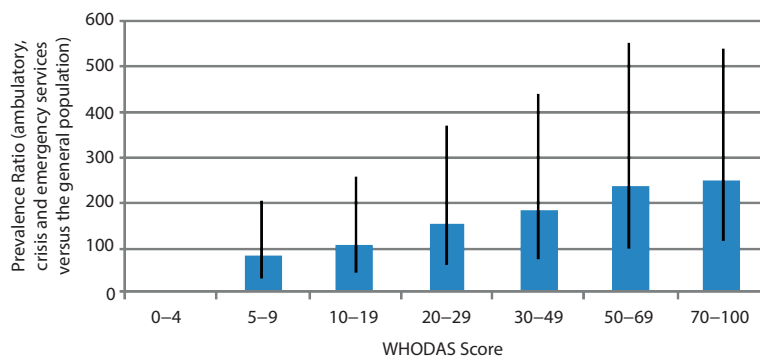
It is illegal to post this copyrighted PDF on any website.

Figure 3. Prevalence Ratios by World Health Organization Disability Assessment Schedule (WHODAS) 2.0 Score for Patients Who Accessed Psychiatric Emergency Services Compared to the General Population for (A) Men and Women, (B) Men, and (C) Women^a

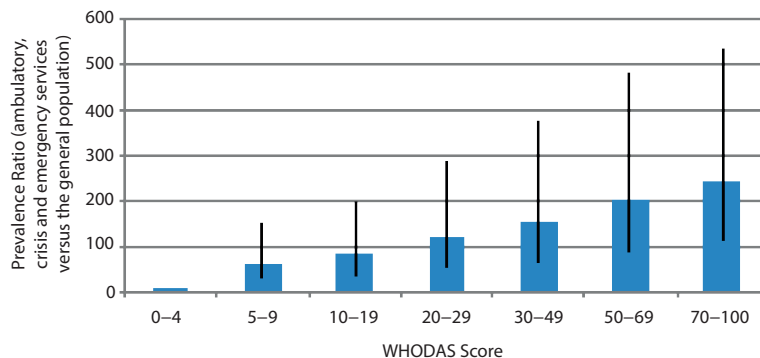
A. Men and Women



B. Men



C. Women



^aError bars represent 95% CIs.

patients who were frequent users of psychiatric emergency services compared to patients who were nonfrequent users of psychiatric emergency services (adjusted for age and gender).

Comparison of the Psychiatric Emergency Services Sample to a General Population Sample

The patients who accessed psychiatric emergency services were more likely to be men, were younger in age, were more likely to have never been married or to have been previously married, and were more likely to be a student or currently unemployed when compared to the general population of

Ontario. As previously noted, the mean WHODAS score for patients who accessed psychiatric emergency services was 38.0, whereas the general population had a significantly different (adjusted for age and gender) mean WHODAS score of 5.2 (95% CI, 4.8–5.6). There was an increasing prevalence ratio of patients who accessed psychiatric emergency services as compared to the general population, as the WHODAS scores increased while controlling for age and gender ($P < .001$). Figure 3 outlines the prevalence ratios by WHODAS scores for patients who accessed psychiatric emergency services in comparison to the general population.

It is illegal to post this copyrighted PDF on any website.

The difference between the general population and the psychiatric emergency services sample was not equal for all domains of disability and functioning. The WHODAS 2.0 questions that provided the greatest relative difference in scores between the general population and the psychiatric emergency services sample were those concerning participation in society, with people in the patient sample being much more emotionally affected by their health problems and having difficulty joining in community activities when compared to the general population.

DISCUSSION

This study is the first to examine disability and functioning using the WHODAS for patients who accessed emergency services (see Supplementary Box 1). Specifically, this study observed no significant differences in disability and functioning between diagnostic categories among patients who accessed psychiatric emergency services. Furthermore, no significant differences were observed in disability and functioning by frequency of psychiatric emergency services use. However, disability and functioning were highly variable *within* diagnostic categories and visit frequency, which may explain our inability to discriminate disability and functioning by diagnosis or visit frequency. This study also observed that psychiatric emergency services patients were more likely to be men, younger in age, never married or previously married, or a student or currently unemployed when compared to the general population. This study also observed that psychiatric emergency services patients experienced greater disability and decreased functioning when compared to the general population.

Disability and Functioning and Their Relationship to Diagnostic Category

Despite what has been observed previously in nonemergency samples,²⁸ and despite distress, disability, dyscontrol, and dysfunction being stated as the basis for mental and behavioral disorder categorizations,^{15,29,30–32} we did not observe differences in disability and functioning by diagnosis. This is consistent with existing evidence about the predictive ability of psychiatric diagnosis alone. Among patients with psychiatric disorders, diagnosis alone is not sufficient to predict service needs,³³ length of hospitalization,³⁴ level of care required,³⁵ and outcomes of hospitalization,³⁶ but the additional measurement of disability improves the prediction of health services utilization,³⁷ length of hospitalization,³⁸ and improvement in functioning after hospitalization.³⁶ Furthermore, the high variability of disability and functioning suggests that measuring disability and functioning will guide treatment interventions and management strategies to align patients with a range of resources and to measure improvements in disability and functioning after the administration of various treatments,¹⁶ and additionally, will improve our limited understanding of the living experiences of a patient with a mental or behavioral disorder.

Frequent Emergency Department Visits

Since 1990, there has been a large increase in the number of mental health-related emergency services visits in the United States and in other countries.^{39–41} Targeting heavy users of emergency services may present an opportunity to minimize emergency services costs while at the same time not jeopardize the health outcomes of this population. Despite what was hypothesized, this study did not find differences in the disability and functioning of frequent users of psychiatric emergency services as compared to nonfrequent users. This observation indicates that other factors that may influence the frequency of psychiatric emergency services use, such as the chronic nature of the condition for which people are seeking treatment, the effectiveness of treatments previously received, satisfaction with treatments previously received, and access to nonemergency mental health care,²¹ should be explored in future research.

Psychiatric Emergency Department Use and Disability and Functioning as Compared to the General Population

Although the WHODAS scores of the psychiatric emergency services sample were higher than the scores of the general population sample, a wide range of disability and functioning among psychiatric emergency patients was observed. Therefore, even at higher scores, an increase in the WHODAS score is associated with an increase in the probability of an individual presenting at psychiatric emergency services. The wide range of scores may indicate that patients with lower WHODAS scores may be using psychiatric emergency services for nonemergency issues.^{11,12,21} Furthermore, our data indicate that women were more likely to seek medical treatment for psychiatric problems at higher WHODAS scores, while men were more likely to seek medical treatment for psychiatric problems at lower WHODAS scores. This has been observed for general hospital emergency departments, with men being more likely to use emergency departments for nonemergency treatment⁴² and women being more likely to seek treatment for psychiatric diseases.⁴³ Therefore, efforts should be made to increase access to and utilization of primary care among men in order to prevent costly emergency department treatment for nonemergency conditions.

Limitations

This study has several limitations. First, psychiatric emergency services are an emerging care model and, as a result, those who access these services may differ from general hospital emergency department psychiatric patients. Second, participants needed to be sufficiently psychologically stable to participate, and thus, individuals with more disabling mental disorders may be underrepresented.¹⁵ Third, this analysis did not correct for the use of other emergency services. Fourth, the clinical sample size was not sufficient to detect small differences in disability and functioning by diagnostic category and did not provide a sufficient sample to study interactions (1) between diagnoses or (2) between

the frequency of emergency department use and diagnosis (eg, the diagnosis of having a substance use disorder has been shown to be a driver of frequent emergency department utilization).¹⁹ Fifth, only the primary diagnosis was provided per visit to the CAMH emergency departments (ie, other co-occurring diagnoses, such as medical or substance use diagnoses, were not recorded), even though these patients could have had psychiatric comorbidities. Last, data on demographic factors such as homelessness and physical health conditions were not collected and, thus, could not be controlled for.

The CAMH Monitors were population telephone surveys and, thus, are limited by multiple factors.^{44–47} For example, the CAMH Monitors excluded populations without a landline or cellphone, such as individuals who are homeless and who are institutionalized (including the hospitalized)^{22,23}; however, the sizes of these populations are small, and thus, their exclusion is unlikely to bias the results of this study.⁴⁴ Additionally, if disability and functioning are associated with participation bias,^{48,49} this bias may lead to an underestimation of WHODAS scores in the general population.

CONCLUSIONS

Among patients who accessed psychiatric emergency services, we observed a large variation in disability and functioning within psychiatric diagnostic categories; however, the disability boundaries between diagnostic categories were nonsignificant. Thus, the use of the WHODAS as a clinical tool in psychiatric emergency departments to collect information on disability and functioning in addition to diagnosis data for patients with mental and behavioral disorders may aid in triaging patients and aligning them with the appropriate intensity of care and resources. The implementation of the WHODAS as a clinical tool is also not overly burdensome; approximately 5 minutes is required to complete the 12-item version of the WHODAS.¹⁶ Furthermore, as disability and functioning were not associated with the frequency of use of psychiatric emergency services, other possible explanations for the frequency of use of such services should be investigated to ensure that these patients are receiving adequate psychiatric care inside and outside of emergency departments to address their specific health care needs.

Submitted: April 25, 2015; accepted November 2, 2015.

Online first: September 13, 2016.

Author contributions: Mr Shield and Drs Shuper, Kurdyak, and Rehm conceptualized the overall article. Mr Shield and Drs Kurdyak and Rehm acquired all data. Mr Shield and Drs Kurdyak and Rehm contributed to the methodology. Mr Shield performed all statistical analyses. All authors contributed to the writing of the manuscript and approved the final version.

Potential conflicts of interest: The authors declare that no additional competing interests exist.

Funding/support: This study was sponsored by the Centre for Addiction and Mental Health (CAMH), Toronto, Canada.

Role of the sponsor: The sponsor approved the study but had no role in the formulation of the study's design and the conduct of the study; the collection, management, analysis, and interpretation of the data; or the preparation, review, or approval of the manuscript.

Disclaimer: All authors are employees of the CAMH, a public hospital in Canada that received its operating funds from the Toronto Central Local Health Integration Network. The views expressed herein are those of the authors and do not necessarily reflect the views of the CAMH.

Acknowledgments: The authors thank Michelle Tortolo, BSc, for referencing the manuscript and Svetlana (Lana) Popova, PhD, MD, for her valuable comments and revisions. Dr Popova and Ms Tortolo (Centre for Addiction and Mental Health, Toronto, Canada) declare no additional competing interests.

Supplementary material: See accompanying pages.

REFERENCES

1. Demyttenaere K, Bruffaerts R, Posada-Villa J, et al; WHO World Mental Health Survey Consortium. Prevalence, severity, and unmet need for treatment of mental disorders in the World Health Organization World Mental Health Surveys. *JAMA*. 2004;291(21):2581–2590.
2. WHO International Consortium in Psychiatric Epidemiology. Cross-national comparisons of the prevalences and correlates of mental disorders. *Bull World Health Organ*. 2000;78(4):413–426.
3. Bijl RV, de Graaf R, Hiripi E, et al. The prevalence of treated and untreated mental disorders in five countries. *Health Aff (Millwood)*. 2003;22(3):122–133.
4. Ratnasingham S, Cairney J, Manson H, et al. The burden of mental illness and addiction in Ontario. *Can J Psychiatry*. 2013;58(9):529–537.
5. Institute for Health Metrics and Evaluation. *GBD Compare*. Seattle, WA: Institute for Health Metrics and Evaluation; 2015.
6. Murray CJ, Barber RM, Foreman KJ, et al; GBD 2013 DALYs and HALE Collaborators. Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990–2013: quantifying the epidemiological transition. *Lancet*. 2015;386(10009):2145–2191.
7. Prince M, Patel V, Saxena S, et al. No health without mental health. *Lancet*. 2007;370(9590):859–877.
8. Andrews G, Issakidis C, Carter G. Shortfall in mental health service utilisation. *Br J Psychiatry*. 2001;179(5):417–425.
9. Kohn R, Saxena S, Levav I, et al. The treatment gap in mental health care. *Bull World Health Organ*. 2004;82(11):858–866.
10. Alonso J, Angermeyer MC, Bernert S, et al; ESEMeD/MHEDEA 2000 Investigators, European Study of the Epidemiology of Mental Disorders (ESEMeD) Project. Use of mental health services in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatr Scand suppl*. 2004;109(420):47–54.
11. Gill JM, Mainous AG 3rd, Nsereko M. The effect of continuity of care on emergency department use. *Arch Fam Med*. 2000;9(4):333–338.
12. Grumbach K, Keane D, Bindman A. Primary care and public emergency department overcrowding. *Am J Public Health*. 1993;83(3):372–378.
13. Padgett DK, Brodsky B. Psychosocial factors influencing non-urgent use of the emergency room: a review of the literature and recommendations for research and improved service delivery. *Soc Sci Med*. 1992;35(9):1189–1197.
14. Frances AJ, Widiger T. Psychiatric diagnosis: lessons from the DSM-IV past and cautions for the DSM-5 future. *Annu Rev Clin Psychol*. 2012;8(1):109–130.
15. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Fifth Edition. Washington, DC: American Psychiatric Association; 2013.
16. Üstün TB, Kostanjev N, Chatterji S, et al. *Measuring Health and Disability. Manual for WHO Disability Assessment Schedule WHODAS 2.0*. Geneva, Switzerland: World Health Organization; 2010.
17. World Health Organization. *Towards a Common Language for Functioning, Disability and Health: ICF*. Geneva, Switzerland: World Health Organization; 2002.
18. Sanderson K, Andrews G. Prevalence and severity of mental health-related disability and relationship to diagnosis. *Psychiatr Serv*. 2002;53(1):80–86.
19. Billings J, Raven MC. Dispelling an urban legend: frequent emergency department users have substantial burden of disease. *Health Aff (Millwood)*. 2013;32(12):2099–2108.
20. Pasic J, Russo J, Roy-Byrne P. High utilizers of psychiatric emergency services. *Psychiatr Serv*. 2005;56(6):678–684.
21. LaCalle E, Rabin E. Frequent users of emergency departments: the myths, the data, and the policy implications. *Ann Emerg Med*. 2010;56(1):42–48.
22. Ialomiteanu A, Adlaf E. *CAMH Monitor 2011 Technical Guide*. Toronto, Canada: Centre for Addiction and Mental Health; 2012.
23. Ialomiteanu A, Adlaf E. *CAMH Monitor 2012 Technical Guide*. Toronto, Canada: Centre for Addiction and Mental Health; 2013.
24. World Health Organization. *International Classification of Disability, Functioning and Health*. Geneva, Switzerland: World Health Organization; 2015.

It is illegal to post this copyrighted PDF on any website.

25. Barros AJ, Hirakata VN. Alternatives for logistic regression in cross-sectional studies: an empirical comparison of models that directly estimate the prevalence ratio. *BMC Med Res Methodol*. 2003;3(1):21.
26. R Development Core Team. *R: A Language and Environment for Statistical Computing (Version 3.1.0)*. Vienna, Austria: R Foundation for Statistical Computing; 2014.
27. Lumley T. Analysis of Complex Survey Samples. *J Stat Softw*. 2004;9(8):1–19.
28. Üstün TB, Chatterji S, Kostanjsek N, et al; WHO/NIH Joint Project. Developing the World Health Organization Disability Assessment Schedule 2.0. *Bull World Health Organ*. 2010;88(11):815–823.
29. World Health Organization. *ICD-10 Classification of Mental and Behavioral Disorder: Clinical Descriptions and Diagnostic Guidelines*. Geneva, Switzerland: World Health Organization; 1992.
30. Bergner RM. What is psychopathology? and so what? *Clin Psychol Sci Pract*. 1997;4(3):235–248.
31. Klein DF. Harmful dysfunction, disorder, disease, illness, and evolution. *J Abnorm Psychol*. 1999;108(3):421–429.
32. Widiger TA, Sankis LM. Adult psychopathology: issues and controversies. *Annu Rev Psychol*. 2000;51(1):377–404.
33. National Advisory Mental Health Council. Health care reform for Americans with severe mental illnesses: report of the National Advisory Mental Health Council. *Am J Psychiatry*. 1993;150(10):1447–1465.
34. McCrone P, Phelan M. Diagnosis and length of psychiatric in-patient stay. *Psychol Med*. 1994;24(4):1025–1030.
35. Burns BJ. Mental health service use by adolescents in the 1970s and 1980s. *J Am Acad Child Adolesc Psychiatry*. 1991;30(1):144–150.
36. Rabinowitz J, Modai I, Inbar-Saban N. Understanding who improves after psychiatric hospitalization. *Acta Psychiatr Scand*. 1994;89(3):152–158.
37. Bassett SS, Folstein MF. Cognitive impairment and functional disability in the absence of psychiatric diagnosis. *Psychol Med*. 1991;21(1):77–84.
38. Stoskopf C, Horn SD. Predicting length of stay for patients with psychoses. *Health Serv Res*. 1992;26(6):743–766.
39. Chakravarthy B, Tenny M, Anderson CL, et al. Analysis of mental health substance abuse-related emergency department visits from 2002 to 2008. *Subst Abus*. 2013;34(3):292–297.
40. Kalucy R, Thomas L, King D. Changing demand for mental health services in the emergency department of a public hospital. *Aust N Z J Psychiatry*. 2005;39(1–2):74–80.
41. Larkin GL, Claassen CA, Emond JA, et al. Trends in US emergency department visits for mental health conditions, 1992 to 2001. *Psychiatr Serv*. 2005;56(6):671–677.
42. Béland F, Lemay A, Boucher M. Patterns of visits to hospital-based emergency rooms. *Soc Sci Med*. 1998;47(2):165–179.
43. Kandrack MA, Grant KR, Segall A. Gender differences in health related behaviour: some unanswered questions. *Soc Sci Med*. 1991;32(5):579–590.
44. Shield KD, Rehm J. Difficulties with telephone-based surveys on alcohol consumption in high-income countries: the Canadian example. *Int J Methods Psychiatr Res*. 2012;21(1):17–28.
45. Groves RM. *Survey Errors and Survey Costs*. (Wiley Series in Survey Methodology). Chichester, England: John Wiley and Sons Ltd; 2004.
46. Kish L. *Survey Sampling*. New York, NY: John Wiley & Sons; 1995.
47. Trewin D, Lee G. International comparisons of telephone coverage. In: Groves R, Biemer P, Lyberg L, et al, eds. *Telephone Survey Methodology*. New York, NY: John Wiley & Sons; 1988:9–24.
48. Hill A, Roberts J, Ewings P, et al. Non-response bias in a lifestyle survey. *J Public Health Med*. 1997;19(2):203–207.
49. O'Neill TW, Marsden D, Silman AJ; European Vertebral Osteoporosis Study Group. Differences in the characteristics of responders and non-responders in a prevalence survey of vertebral osteoporosis. *Osteoporos Int*. 1995;5(5):327–334.

Supplementary material follows this article.

It is illegal to post this copyrighted PDF on any website.



Supplementary Material

Article Title: Disability and Functioning of Patients Who Use Psychiatric Hospital Emergency Services

Authors: Kevin D. Shield, MHSc; Paul Kurdyak, MD, PhD; Paul A. Shuper, PhD; and Jürgen Rehm, PhD

DOI Number: 10.4088/JCP.15m10082

List of Supplementary Material for the article

1. [Box 1](#) WHODAS use in emergency services

Disclaimer

This Supplementary Material has been provided by the author(s) as an enhancement to the published article. It has been approved by peer review; however, it has undergone neither editing nor formatting by in-house editorial staff. The material is presented in the manner supplied by the author.

Box A1. WHODAS use in emergency services*Systematic search strategy*

We searched PubMed up to and including March 24, 2015 using the measurement search terms: "WHODAS", "WHO DAS", "World Health Organization Disability Assessment Schedule", "World Health Organization's Disability Assessment Schedule", "WHO Disability Assessment Schedule", "WHO's Disability Assessment Schedule" combined with the population search terms: "emergency", "ambulatory", "crisis". The systematic review was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Guidelines ⁵⁴.

Results and interpretation

Of the four search results that were returned, none was relevant after examination of titles and abstracts. The WHODAS has never been used in peer-reviewed research to examine disability and functioning among people who visit psychiatric hospital emergency services. Therefore, this is the first study to examine the use of WHODAS to measure disability and functioning in an emergency services setting. The use of measures such as the WHODAS to accurately measure disability and functioning within emergency patient populations may be a useful additional tool to help triage patients as well as to assist medical personnel in determining appropriate treatment(s).