Suicide Risk and Acute Psychiatric Readmissions: A Prospective Cohort Study

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Objective: The objective was to improve knowledge of the role and functioning of psychiatric acute wards with respect to admissions because of suicide risk and factors associated with readmission. _Methods:_ Over one year, 1,245 consecutive psychiatric patients from a Norwegian catchment area were included at index admission and reassessed in cases of readmission. After a mean follow-up period of 562 days, a total of 1,234 readmissions were assessed. Time from discharge to readmission was analyzed with univariate and multivariate Cox regression analyses. Outcome variables included acute readmissions and readmissions for suicide risk. _Results:_ Fifty-four percent of the index admissions and 62% of the readmissions were related to suicide risk. Substance use disorders, personality disorders, prior psychiatric hospitalization, unemployment, and receipt of social benefits were significant predictors of any readmissions and readmissions because of suicide risk. At index admission suicidal ideation or suicide plans significantly predicted readmission because of suicide risk. A small subgroup of patients contributed disproportionately to the number of readmissions. A higher number of readmissions per individual patient was associated with greater tendency of admission because of suicide risk. _Conclusions:_ The acute ward played an important role for patients with suicidal behavior. Care providers and clinicians should focus on staff training and supervision with regard to assessment and management of suicidal patients. Collaboration with referring physicians and aftercare providers is also important to help patients gain constructive coping strategies and break patterns of suicidal behavior and readmission. (_Psychiatric Services_ 61:25–31, 2010)

Persistent demand for acute psychiatric hospitalization is of great concern to health care providers and often causes strain on patients, clinicians, and caregivers (1,2). High rates of bed turnover and bed occupancy are commonly closely associated with high rates of readmission (3), which may be seen as counterproductive to the optimal use of psychiatric health care resources. Some patients and their families may perceive readmission as a negative event resulting from treatment failure. Others may regard it as needed and helpful (4). It is important to understand the role of acute psychiatric hospitalization in health care, particularly for patients with suicidal behavior, because the intervention of acute psychiatric hospitalization is commonly regarded as having high potential for suicide prevention (5).

Some cohort- and register-based studies that focused on psychiatric diagnoses as possible predictors of psychiatric readmission found increased readmission rates to be associated with a diagnosis of psychosis or personality disorder (6) or an affective disorder (7). Co-occurring disorders, in particular a substance use disorder and schizophrenia, have been found in some studies (8,9) but not in others (7) to increase the risk of readmission.

Most clinicians involved in emergency psychiatric care would probably consider suicide risk to be a major cause of acute psychiatric admissions (including readmissions). A review of the literature shows, however, that there is a striking scarcity of cohort- and register-based studies of unselected psychiatric populations reporting on this association. One study that reported on prevention of suicide and self-harm as a reason for acute admission found that suicidal behavior was the major cause of 21% of admissions and a contributing cause of an additional 15% of admissions (10). The authors of that study did not, however, provide a follow-up analysis of potential predictors of subsequent readmissions. In a chart review of a randomized sample of psychiatrically hospitalized patients, Bernardo and Forchuk (11) found that concerns about risk of suicide were involved in

29% of the index admissions. However, patients who were readmitted did not differ from those not readmitted in terms of history of suicide attempts. The bulk of studies published so far have been conducted with selected samples in highly variable settings and with highly variable definitions of readmission (4,12,13). A reason why there are so few cohort- and register-based studies reporting on acute psychiatric admission and readmission related to suicide risk may be that data on suicidal behavior are rarely recorded routinely and in a way that would allow systematic analysis.

In this prospective cohort study, we aimed to determine which variables are associated with acute psychiatric admission and readmission, with a particular focus on suicide risk as a reason for such admissions. Our sample consisted of consecutively admitted patients from a defined catchment area.

Methods

Setting

All acute admissions to the Department of Psychiatry at the Haukeland University Hospital in Bergen, Norway, which has a catchment area of 400,000 inhabitants, were included. In Norway the entire population is covered by a government-funded public health service and Social Security–type benefits. This coverage enables the study of an unselected and representative population from a defined geographic area. Thus social needs (such as a place to live) were of minor importance as factors in admission. During the study period, about 95% of all patients from the catchment area and in need of emergency psychiatric admission were received at the 19-bed psychiatric department's acute unit. The rest of the patients were not in need of a high staff-to-patient ratio and were directly admitted to open wards near their homes.

The purpose of the acute unit is to evaluate and diagnose patients in acute need of treatment and care, to assess possible risk of danger to self or others, and to provide acute treatment, including protective measures, if required. The mean±SD length of stay in the acute unit is 4.3±5.1 days, and 61% of patients are subsequently transferred to other psychiatric inpatient wards. The remaining 39% of patients are discharged and referred to psychiatric outpatient clinics, addiction clinics, general practitioners, or community care for follow-up.

Patients

All psychiatric patients admitted to the acute unit from May 1, 2005, to April 30, 2006, were included in the study. Each patient's first admission during this period was termed the index admission. Data from all readmissions in the follow-up period (until April 30, 2007) were recorded. There were 1,245 index admission patients (672 males, 54%) with 1,234 readmissions, totaling 2,479 admissions. Mean age at index admission was 41.6±16.4. The mean follow-up time, which was the same whether patients were or were not readmitted because of suicide risk, was 562.3±102.7 days (range 366.6–729.2 days). Most patients (1,129 patients, 91%) were born in Norway. The Regional Committee for Medical Research Ethics and the Norwegian Data Inspectorate approved this study.

Readmission

Readmissions included all subsequent admissions during the study period after discharge from the index admission and were recorded as general readmissions (that is, readmitted for any reason) and as readmissions because of suicide risk.

Measures

Sociodemographic and clinical data were prospectively collected at the index admission by research assistants trained for the purpose. Suicide risk assessment was conducted by experienced intake clinicians trained to score the categories on a standardized form. Using all available information, including information from the referral physician, they scored whether the admission was related to suicidal behavior (defined as suicidal ideation, suicidal plans, or an act of deliberate self-harm).

An admission was defined as related to suicide risk if such risk was either the main or a contributory reason for referring the patient for admission or if the clinical assessment at admission revealed that the patient had engaged in suicidal behavior immediately before the admission. Admissions because of suicide risk were separated into admissions of patients presenting with suicidal ideation or plans, nonsuicidal self-injurious behaviors (such as cutting or self-poisoning—behaviors mainly intended to relieve distress or signal a cry for help), and suicide attempt. Admissions unrelated to suicide risk were labeled admissions with no known suicide risk. Diagnoses at index admission (primary and two secondary diagnoses) were made according to the *ICD-10*. Symptom severity at discharge from the index admission was measured with the Global Assessment of Functioning–Split Version (GAF-S) (14,15). Psychiatrists, experienced registrars, or psychologists in charge of the patient's treatment during the index stay made the diagnostic and GAF-S assessments. The research assistants recorded service utilization data, including use of mental health care before the index admission, follow-up agency used after discharge from the index admission stay, and length of hospital stay at index admission.

Statistical methods

We analyzed the predictors of time to readmission by survival analysis, which has been suggested to be an appropriate method when studying changes over time (16). We assessed the predictors' impact on time to readmission by univariate and multivariate Cox regression analyses. Multivariate Cox regression allowed for simultaneous analysis of the effect of the predictors on the exact time between index discharge and first readmission, with adjustment for differences in observation time. In the Cox model, linearity of continuous covariates was checked by transcan plots based on singly imputed data, and we entered the covariates nonlinearly when needed in the final estimation, which was based on multiply imputed data (ten imputations). A nonlinear relationship means that the hazard ratio (HR) for, say, an increase from ten to 20 points in the covariate, may not be the same as the HR for an increase from 20 to 30 points. We performed

Cox analyses for time to any readmission and time to readmission because of suicide risk; in the latter analysis, readmissions for other reasons were censored. Of the 1,245 patients with an index admission during the inclusion year, we entered 1,156 patients (93%) into the analyses. Patients were excluded from the analyses if they were still hospitalized, directly readmitted from another ward (had not spent time outside the hospital since the index admission), or died in the hospital. We repeated the analyses without including treatment before the index admission, because this variable might have been a proxy for the patient's illness rather than an independent factor.

The rate of readmissions during follow-up after the index admission was analyzed with Poisson regression with the same covariates. For all analyses, we used the statistical program R (R Foundation for Statistical Computing, Vienna, Austria) with the R Package Design for Cox analyses (17).

Results

Table 1 provides a descriptive overview of the sociodemographic, clinical, diagnostic, and treatment-related variables included in the analyses of risk of readmission, the results of which are shown in Tables 2 and 3. For practical reasons, the covariates for GAF-S score and length of stay are presented in Table 3, although they were analyzed in the model together with the other covariates.

Overview of readmissions

Suicide risk was the main or contributing reason for 617 (54%) of the 1,245 index admissions (with disregard of 101 missing values). The distribution of the covariates for suicidal ideation or plans, deliberate self-harm, and no known suicide risk among the total index admission patients and the 1,156 at risk for readmission who were entered into the Cox analysis (Table 1) differed little, only in decimal values. Of the patients with index admission because of suicide risk, 42% (259 patients) were readmitted at least once during the study period, compared with 43% (226 patients) of those with index admissions not related to suicide risk.

Table 1

Descriptive characteristics of patient (N=1,156) covariates included in the Cox regression analysis[a]

Background variables at index admission	N	%
Male	631	55
Age (mean±SD)	41.9±16.6	
Source of income[b]		
Employed, full-time student, or retired	324	30
Sick leave or receiving benefits for disability, unemployment, or social program	755	70
Housing or cohabitation[b]		
Cohabiting with partner, family, or other person	462	42
Living alone	480	43
Nursing home or part-time staffed residence	85	8
Homeless, sheltered house, asylum center, or prison	83	8
Education[b]		
Primary school	531	48
Beyond primary school	569	52
Admission because of suicide risk[b]		
Suicidal ideation or plans	453	42
Nonsuicidal self-injurious behaviors	65	6
Suicide attempt	61	6
No known suicide risk	487	46
Schizophrenia, schizotypal, or delusional disorder (psychotic disorders F20–F29[c])		
Schizophrenia or schizoaffective disorder	157	14
Other psychotic disorders	103	9
No psychotic disorders	896	78
Mood disorder (F30–F39[c])		
Bipolar manic episode	78	7
Bipolar depressive episode	97	8
Depression without psychosis	280	24
Depression with psychosis	38	3
No mood disorder	663	57
Substance use disorder (F10–F19[c])	313	27
No substance use disorder	843	73
Anxiety disorder, adjustment disorder, or posttraumatic stress disorder (F40–F48[c])	247	21
No anxiety disorder, adjustment disorder, or posttraumatic stress disorder	909	79
Personality disorder (F60–F69[c])	115	10
No personality disorder	1,041	90
Mental health care before index admission[b]		
Psychiatric admission >1 year ago	216	20
Psychiatric admission within past year	408	37
Outpatient treatment or day hospitalization within past year	245	23
No previous contact	221	20
Follow-up agency (patient referred to at discharge)		
Psychiatric outpatient treatment	575	50
General practitioner	362	31
Addiction clinic	61	5
Full-time care facility	57	5
Prison health care system	31	3
Somatic hospital	44	4
No or other follow-up	26	2
GAF-S score at discharge from index admission (mean±SD)[d]	51.6±13.5	
Length of stay of index admission (mean±SD days)	32.0±55.5	

[a] The total sample consisted of 1,245 patients; 1,156 were discharged from the index admission during the study period and were thus at risk for readmission. Those excluded from the data shown above were patients still hospitalized or directly readmitted from another ward (no time spent outside hospital since index admission) and patients who had died in the hospital. Because of rounding methods, percentages for some variables do not add to 100%.

[b] Missing data

[c] F00–F99 are *ICD-10* codes for mental and behavioral disorders.

[d] Global Assessment of Functioning–Split Version. Possible scores range from 0 to 100, with higher scores indicating better functioning.

Table 2

Predictors of time to readmission for 1,156 patients with an index admission between May 1, 2005, and April 30, 2006[a]

Covariate (reference group)	General readmissions						Readmissions because of suicide risk					
	CHR	95% CI	p	AHR	95% CI	p	CHR	95% CI	p	AHR	95% CI	p
Female (male)	1.16	.97–1.40	.104	1.23	1.01–1.50	.042	1.34	1.04–1.72	.024	1.32	.99–1.75	.055
Age per 10 years[b]	.82	.72–.93	.002	.88	.75–1.04	.138	.50	.38–.67	<.001	.65	.47–.91	.012
Income: sick leave, disability, unemployment, or social benefit (employed, full-time student, or retired)	2.16	1.70–2.74	<.001	1.36	1.04–1.78	.026	2.74	1.90–3.94	<.001	1.70	1.14–2.53	.010
Housing (cohabiting with partner, family, or other person)			.003			.099			.203			.347
Living alone	1.41	1.15–1.73		1.31	1.06–1.63		1.27	.96–1.68		1.30	.97–1.74	
Nursing home or part-time staffed residence	1.45	1.02–2.07		1.12	.76–1.64		1.11	.66–1.88		1.25	.71–2.19	
Homeless, sheltered house, asylum center, or prison	1.58	1.12–2.23		1.13	.75–1.71		1.53	.96–2.43		1.03	.60–1.78	
Education beyond primary school (primary school)	.84	.70–1.01	.065	.97	.79–1.19	.769	.87	.67–1.12	.280	.99	.75–1.30	.937
Index admission because of suicide risk (no known risk)			.414			.551			<.001			<.002
Suicidal ideation or plans	1.04	.86–1.27		1.05	.84–1.31		2.66	1.96–3.61		1.89	1.35–2.65	
Nonsuicidal self-injurious behaviors	.71	.45–1.14		.75	.46–1.22		1.89	1.07–3.36		1.22	.67–2.22	
Suicide attempt	.86	.55–1.35		.90	.56–1.46		2.17	1.25–3.79		1.58	.86–2.89	
Schizophrenia, schizotypal, or delusional or psychotic disorder (none)			<.001			.500			<.001			.042
Schizophrenia or schizoaffective	1.60	1.26–2.03		1.22	.86–1.72		.56	.35–.90		.63	.35–1.14	
Other psychotic disorder	1.04	.75–1.44		1.01	.69–1.49		.25	.11–.55		.37	.16–.88	
Mood disorder (none)			.123			.548			<.001			.077
Bipolar manic episode	.83	.56–1.23		.85	.54–1.34		.49	.23–1.05		.57	.25–1.30	
Bipolar depressive episode	1.29	.95–1.75		1.13	.79–1.62		1.86	1.25–2.76		1.36	.86–2.14	
Nonpsychotic depression	.92	.74–1.15		1.12	.85–1.48		1.56	1.17–2.07		1.39	.99–1.97	
Psychotic depression	.61	.32–1.14		.74	.38–1.47		.83	.36–1.88		.83	.34–2.01	
Substance use disorder (none)	1.36	1.12–1.65	.002	1.48	1.17–1.87	.001	1.85	1.43–2.39	<.001	1.60	1.17–2.18	.003
Anxiety or adjustment disorder or PTSD[c] (none)	.89	.71–1.12	.308	1.01	.78–1.31	.928	1.37	1.03–1.82	.029	1.25	.91–1.72	.175
Personality disorder (none)	1.65	1.26–2.15	<.001	1.39	1.04–1.86	.026	2.52	1.83–3.46	<.001	1.64	1.15–2.32	.006
Mental health care before index admission (no previous contact)			<.001			<.001			<.001			<.001
Psychiatric admission >1 year ago	1.98	1.35–2.88		1.68	1.14–2.47		1.80	1.04–3.11		1.62	.93–2.83	
Psychiatric admission within past year	3.79	2.71–5.21		2.70	1.86–3.91		4.09	2.59–6.48		2.91	1.74–4.85	
Outpatient treatment or day hospital within past year	2.11	1.46–3.05		1.68	1.46–3.05		2.31	1.39–3.81		1.58	.93–2.68	
Follow-up agency referred to at discharge (psychiatric outpatient treatment)			.028			.055			.009			.628
General practitioner	1.04	.84–1.27		1.15	.92–1.44		.85	.63–1.14		.90	.65–1.22	
Addiction clinic	1.13	.76–1.69		.90	.57–1.41		1.67	1.06–2.63		1.01	.60–1.70	
Full-time care facility	.45	.25–.81		.58	.31–1.07		.28	.10–.74		.51	.18–1.42	
Prison health care	1.52	.93–2.49		2.07	1.14–3.75		1.46	.74–2.86		1.68	.76–3.73	
Somatic hospital	.98	.60–1.60		1.16	.68–1.97		.63	.28–1.43		.91	.39–2.14	
No or other follow-up	.49	.22–1.11		.82	.36–1.89		.74	.30–1.82		1.16	.46–2.95	

[a] The follow-up period was up to April 30, 2007. Cox regression analysis yielded crude (CHR) and adjusted hazard ratios (AHR), 95% confidence intervals, and p values for general readmissions and readmissions because of suicide risk. Continuous covariates entered nonlinearly are in Table 3.

[b] Age was modeled linearly from the age of 50 (interpretable pattern consistent with the transcan plot). AHR was per 10 years.

[c] Posttraumatic stress disorder

Half of the total 2,479 admissions (N=1,234) represented a readmission, and suicide risk was the main or contributing reason for 714 (62%, 86 missing values disregarded) of these readmissions. For the 1,156 patients at risk for readmission, 113 (10%) were readmitted within one month of discharge from the index admission, 310 (27%) were readmitted within six months, and 409 (35%) were readmitted within 12 months. Of this

Table 3

Flexible nonlinear modeling with GAF-S score and length of stay as predictors of time to readmission for 1,156 patients with an index admission between May 1, 2005, and April 30, 2006[a]

Covariate	General readmissions						Readmissions because of suicide risk					
	CHR	95% CI	p	AHR	95% CI	p	CHR	95% CI	p	AHR	95% CI	p
GAF-S score at discharge from index admission (nonlinear)[b]			.004			.021			.004			.523
			.377			.418			.002			.866
0–10	1.01	.81–1.27		.77	.61–.98		1.69	1.07–2.67		.94	.62–1.44	
10–20	1.01	.81–1.27		.77	.61–.98		1.69	1.07–2.67		.94	.62–1.44	
20–30	1.01	.81–1.27		.77	.61–.98		1.69	1.07–2.67		.94	.62–1.44	
30–40	.99	.82–1.20		.79	.65–.96		1.60	1.08–2.36		.94	.66–1.36	
40–50	.89	.78–1.02		.90	.77–1.04		1.15	.94–1.40		.96	.77–1.19	
50–60	.83	.72–.96		.96	.82–1.12		.81	.66–.99		.92	.74–1.14	
60–70	.83	.69–1.01		.92	.76–1.12		.69	.51–.93		.85	.64–1.14	
70–80	.84	.65–1.07		.91	.71–1.18		.66	.45–.97		.84	.57–1.22	
80–90	.84	.65–1.07		.91	.71–1.18		.66	.45–.97		.84	.57–1.22	
90–100	.84	.65–1.07		.91	.71–1.18		.66	.45–.97		.84	.57–1.22	
Days of stay at index admission (nonlinear)[b]			<.001			<.001			.004			.021
			<.001			<.001			.002			.009
0–10	2.06	1.55–2.72		2.01	1.49–2.71		1.85	1.28–2.67		1.86	1.25–2.75	
10–20	1.13	1.06–1.20		1.14	1.06–1.22		.99	.90–1.08		1.08	.98–1.19	
20–30	.92	.85–1.00		.94	.86–1.02		.82	.72–.93		.91	.80–1.03	
30–40	.94	.88–1.00		.94	.88–1.01		.85	.77–.94		.92	.83–1.02	
40–50	.95	.91–1.00		.95	.91–1.00		.89	.83–.95		.94	.87–1.02	
50–60	.97	.93–1.00		.96	.93–1.00		.92	.87–.97		.96	.91–1.02	
60–70	.98	.95–1.00		.97	.95–1.00		.95	.91–.98		.98	.94–1.01	
70–80	.99	.97–1.01		.98	.96–1.00		.97	.94–1.00		.99	.96–1.02	
80–90	.99	.97–1.02		.98	.96–1.01		.99	.96–1.02		1.01	.97–1.03	
120–130	1.00	.98–1.03		.99	.96–1.02		1.02	.98–1.06		1.01	.97–1.05	

[a] The follow-up period was up to April 30, 2007. Cox regression analysis yielded crude (CHR) and adjusted hazard ratios (AHR), 95% confidence intervals, and p values for general readmissions and readmissions because of suicide risk.

[b] For these covariates, a nonlinear relationship was assumed. The first p value is the overall p value for the covariate in question; the second p value is for a nonlinear relationship. GAF-S, Global Assessment of Functioning–Split Version. Possible scores range from 0 to 100, with higher scores indicating better functioning.

same group, the readmissions because of suicide risk represented 59 (5%) within one month, 161 (14%) within six months, and 211 (18%) within 12 months.

Patients with more readmissions than others were more likely to be readmitted because of suicide risk. For instance, a subgroup of 93 (8%) patients had five readmissions during the study period, of which 65% were because of suicide risk. The ten most frequently admitted patients had 134 admissions, of which 81% (109 readmissions) were because of suicide risk (53% for suicidal ideation or plans, 16% for suicide attempt, and 12% for nonsuicidal self-injurious behavior).

General readmission

Tables 2 and 3 show HRs from univariate and multivariate analyses of general risk of readmission. In multivariate analysis, prior psychiatric treatment was an important predictor. Follow-up treatment after index discharge by the prison health care system was associated with a more than doubled risk of readmission, whereas substance use disorders and personality disorders were the only diagnoses associated with an increased risk of readmission. The effect of symptom severity (from the GAF-S) at discharge from the index admission on rate of readmission was mainly noticeable for low GAF-S values. Living alone, receiving a disability pension, receiving social or unemployment benefits as a main source of income, and, to some extent, being female were also associated with a higher risk of general readmission. Finally, risk increased with the length of index stay but only if the stay did not exceed approximately ten days.

Because former psychiatric admissions could be a proxy for underlying illness, we repeated the multivariate analysis, excluding the covariate mental health care before index admission. In this analysis (not shown in the tables), there was an HR of 1.42 (95% confidence interval=1.01–1.99) for schizophrenia and schizoaffective disorders, compared with the reference group having no psychotic disorders, but otherwise we observed only small changes in the results.

A Poisson regression analysis (not shown in the tables) showed that the rate of readmission was predicted by the same variables that predicted time to first readmission, analyzed by the Cox regression.

Readmission because of suicide risk

In multivariate analysis (Tables 2 and 3), hospitalization before index admission was associated with increased risk of readmission because of suicide risk, as were suicidal ideation at index admission, disability pension or sick-leave compensation, unemployment

or social benefits, and increased length of stay up to about ten days. Patients with personality disorders and substance use disorders also had an increased risk of being readmitted because of suicide risk, and older patients had a decreased risk. Repeated multivariate analysis excluding the covariate mental health care before index admission (not shown in the table) resulted in only minor changes, except that female patients and patients living alone had a higher risk of readmission because of suicide risk.

Discussion

To get a detailed picture of the heterogeneous group of patients admitted to our psychiatric acute ward because of risk of suicide, we assessed whether the risk was associated with ideation or plans, nonsuicidal self-injurious behaviors, or suicide attempt. This examination enabled us to analyze in a multivariate model each of these categories together with other clinical and sociodemographic variables as possible predictors of readmission in a large and representative clinical sample.

The finding that 54% of the total index admissions were related to suicide risk is considerably higher than corresponding rates of 29% and 35% previously reported in studies from Canada (11) and the United Kingdom (10). Our prospective recording of suicide risk as a reason for admission may have identified more admissions because of such risk when it was present than retrospective studies based on hospital records. The higher proportion of admissions because of suicide risk in our study may also reflect actual differences having emerged since the previous studies were conducted in the early 1990s. The downsizing of psychiatric hospitals in recent decades (3,18) seems, in North America and Europe, to increasingly have transformed inpatient psychiatric treatment units into short-term crisis-intervention facilities. Consequently, significant tasks of today's acute psychiatric wards seem to be the assessment, management, treatment, and, whenever needed, the protection of patients at risk of suicidal behavior.

A majority of patients' index admissions for risk of suicide were characterized by suicidal ideation or plans. This subgroup also had increased risk of readmissions because of suicide risk. Further research is needed to examine whether the treatment and follow-up of these patients are or should be different from that of those who present with deliberate self-harm of any kind. For some patients in the suicidal ideation or plans group, the risk of suicide may be low, although their need for help may be substantial. Others in this subgroup may be at high risk of suicide.

In line with the above finding, we identified a small subgroup of patients who had a high number of readmissions because of suicide risk. Other studies have found the same pattern (19), and, to some extent, this pattern may indicate that these patients experience suicidal behavior as a way to communicate and regulate feelings and as a way of getting help when more constructive coping strategies are insufficient (20). The finding that a higher number of readmissions for individual patients was related to an increased tendency to present with suicide risk has, to our knowledge, not been reported by others. We even found that suicide attempts and nonsuicidal self-injurious behavior increased among the most frequently readmitted patients. However, the data collected did not allow us to assess whether the risk of suicide increases for patients with a longer duration of mental illness or whether risk of suicide represents a poor coping strategy, as discussed above.

Clinical implications suggested by these findings are that clinicians should focus on examining whether suicidal ideation or planning represents a genuine death wish, is a cry for help, or represents some other pattern of help-seeking behavior. Such examination may provide significant information in treatment planning with regard to implementing protective measures and psychosocial and psychopharmacological interventions.

The decision to admit patients is often determined by several factors, and some of the most important covariates that predicted time to readmission in our multivariate analysis

have also been reported by others. Further, clinicians and caregivers should be aware of the readmission risk when patients have been hospitalized before (11,12,21), have a diagnosis of personality disorder (22) or substance use disorder (23), and are living alone or receiving a disability pension or social or unemployment benefit (11,16,24).

In this study patients who had a length of index stay lasting up to ten days presented a higher risk of readmission than did patients with a stay of only one day or night. It may be that some of the patients who had the shortest hospital stays were mainly in need of short-term crisis intervention and that patients with stays of up to ten days might have had more complex needs.

It may be questioned whether the results from this study are generalizable to countries with health care systems different from the Norwegian one. The policy of admitting patients because of suicide risk may, however, vary both within and between countries. Only 19 beds were available for all acute admissions from a catchment area of 400,000 inhabitants; thus the admissions were regarded by those in charge of the admissions as needed. This fact, together with the representativeness and heterogeneity of the sample, gives us reason to believe that our results may be useful to clinicians in other settings, both in Norway and in other countries.

Conclusions

Fifty-four percent of the total admissions and 62% of the readmissions in this patient sample were related to suicide risk. Furthermore, patients with more readmissions were more likely to be readmitted for suicide risk. Patients with an index admission related to suicidal ideation or planning had increased risk of readmission because of suicide risk. A history of psychiatric hospitalization during the previous year, having a personality disorder or a substance use disorder, and living alone or receiving a disability pension or social or unemployment benefit also predicted readmission.

If it is correct that emergency psychiatric inpatient care units, such as

the one we investigated, are increasingly becoming assessment and treatment facilities for patients who are admitted because of suicide risk, care planners and clinicians probably need to strengthen their focus on staff training and supervision for the assessment and management of suicidal patients and for collaboration with referring physicians and aftercare providers.

References

1. Munk-Jørgensen P: Has deinstitutionalization gone too far? European Archives of Psychiatry and Clinical Neuroscience 249:136–143, 1999

2. Beck A, Croudace TJ, Singh S, et al: The Nottingham Acute Bed Study: alternatives to acute psychiatric care. British Journal of Psychiatry 170:247–252, 1997

3. Heggestad T: Operating conditions of psychiatric hospitals and early readmission: effects of high patient turnover. Acta Psychiatrica Scandinavica 103:196–202, 2001

4. Montgomery P, Kirkpatrick H: Understanding those who seek frequent psychiatric hospitalizations. Archives of Psychiatric Nursing 16:16–24, 2002

5. Mann JJ, Apter A, Bertolote J, et al: Suicide prevention strategies: a systematic review. JAMA 294:2064–2074, 2005

6. Korkeila JA, Lehtinen V, Tuori T, et al: Frequently hospitalized psychiatric patients: a study of predictive factors. Social Psychiatry and Psychiatric Epidemiology 33:528–534, 1998

7. Arnold EM, Goldston DB, Ruggiero A, et al: Rates and predictors of rehospitalization among formerly hospitalized adolescents. Psychiatric Services 54:994–998, 2003

8. Madi N, Zhao H, Li JF: Hospital readmissions for patients with mental illness in Canada. Healthcare Quarterly 10:30–32, 2007

9. Vogel S, Huguelet P: Factors associated with multiple admissions to a public psychiatric hospital. Acta Psychiatrica Scandinavica 95:244–253, 1997

10. Flannigan CB, Glover GR, Wing JK, et al: Inner London collaborative audit of admission in two health districts: III. reasons for acute admission to psychiatric wards. British Journal of Psychiatry 165:750–759, 1994

11. Bernardo AC, Forchuk C: Factors associated with readmission to a psychiatric facility. Psychiatric Services 52:1100–1102, 2001

12. Durbin J, Lin E, Layne C, et al: Is readmission a valid indicator of the quality of inpatient psychiatric care? Journal of Behavioral Health Services and Research 34:137–150, 2007

13. Lien L: Are readmission rates influenced by how psychiatric services are organized? Nordic Journal of Psychiatry 56:23–28, 2002

14. Endicott J, Spitzer RL, Fleiss JL, et al: The Global Assessment Scale: a procedure for measuring overall severity of psychiatric disturbance. Archives of General Psychiatry 33:766–771, 1976

15. Karterud S, Pedersen G, Loevdahl H, et al: Global Assessment of Functioning–Split Version (GAF-S): Background and Scoring Manual. Oslo, Norway, Ullevål University Hospital, Department of Psychiatry, 1998

16. Oiesvold T, Saarento O, Sytema S, et al: Predictors for readmission risk of new patients: the Nordic Comparative Study on Sectorized Psychiatry. Acta Psychiatrica Scandinavica 101:367–373, 2000

17. Harrell FE: Regression Modelling Strategies. New York, Springer, 2001

18. Tyrer P, Suryanarayan G, Rao B, et al: The Bed Requirement Inventory: a simple measure to estimate the need for a psychiatric bed. International Journal of Social Psychiatry 52:267–277, 2006

19. Fisher S, Stevens RF: Subgroups of frequent users of an inpatient mental health program at a community hospital in Canada. Psychiatric Services 50:244–247, 1999

20. Linehan M, Rizvi SL, Shaw-Welsh S: Psychiatric aspects of suicidal behaviour: personality disorders; in International Handbook of Suicide and Attempted Suicide. Edited by Hawton K, van Heeringen K. Sussex, England, Wiley, 2000

21. Roick C, Heider D, Kilian R, et al: Factors contributing to frequent use of psychiatric inpatient services by schizophrenia patients. Social Psychiatry and Psychiatric Epidemiology 39:744–751, 2004

23. Irmiter C, McCarthy JF, Barry KL, et al: Reinstitutionalization following psychiatric discharge among VA patients with serious mental illness: a national longitudinal study. Psychiatric Quarterly 78:279–286, 2007

24. Mojtabai R, Nicholson RA, Neesmith DH: Factors affecting relapse in patients discharged from a public hospital: results from survival analysis. Psychiatric Quarterly 68:117–129, 1997