



Predictors of involuntary hospitalizations to acute psychiatry

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ABSTRACT

Introduction: There is little knowledge of predictors for involuntary hospitalizations in acute psychiatric units. **Method:** The Multi-center study of Acute Psychiatry included all cases of acute consecutive psychiatric admissions in twenty acute psychiatric units in Norway, representing about 75% of the acute psychiatric units during 2005–2006. Data included admission process, rating of Global Assessment of Functioning and Health of the Nation Outcome Scales.

Results: Fifty-six percent were voluntary and 44% involuntary hospitalized. Regression analysis identified contact with police, referral by physicians who did not know the patient, contact with health services within the last 48 h, not living in own apartment or house, high scores for aggression, level of hallucinations and delusions, and contact with an out-of office clinic within the last 48 h and low GAF symptom score as predictors for involuntary hospitalization. Involuntary patients were older, more often male, non-Norwegian, unmarried and had lower level of education. They more often had disability pension or received social benefits, and were more often admitted during evenings and nights, found to have more frequent substance abuse and less often responsible for children and were less frequently motivated for admission. Involuntary patients had less contact with psychiatric services before admission. Most patients were referred because of a deterioration of their psychiatric illness.

Conclusion: Involuntary hospitalization seems to be guided by the severity of psychiatric symptoms and factors “surrounding” the referred patient. Important factors seem to be male gender, substance abuse, contact with own GP, aggressive behavior, and low level of social functioning and lack of motivation. There was a need for assistance by the police in a significant number of cases. This complicated picture offers some important challenges to the organization of primary and psychiatric health services and a need to consider better pathways to care.

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1. Introduction

The use of involuntary hospitalization (IH) in psychiatric institutions has been intensively debated by patients, mental health workers, relatives' organizations, human rights' organizations and legislators during the last decades (La Fond & Srebniak, 2002; Szasz, 2006). It is both a professional and a political goal to limit IH to those in need. However, little is known concerning the optimal use of IH and the factors that determine the use of IH.

1.1. Background

Rates of IH and involuntary psychiatric treatment of people with mental illness reflect characteristics of national mental health care and laws or other legal frameworks (Salize & Dressing, 2004). International studies on the use of IH in psychiatric hospitals show great variability in rates from 6 (in Portugal) to 218 (in Finland) per 100,000 inhabitants per year (Barbato & D'Avanzo, 2005; Mulder et al., 2008; Salize & Dressing, 2004). It is, however, very difficult to compare figures because studies have different designs and the EU countries have different legislation.

1.2. Norwegian Law

In Norway general practitioners (GP's) or other physicians working outside a psychiatric hospital may refer a patient to be assessed for voluntary or involuntary hospitalization. After the patient has arrived at the acute psychiatric unit, a psychiatrist (or a physician and clinical psychologist approved for this) finally decides whether the patient's admission should be voluntary or involuntary.

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According to the Norwegian Mental Health Act referrals for involuntary psychiatric admissions can only be to inpatient units in hospital departments or community mental health centers certified for this (Ministry of Health and Care Services, 1999, 2006). Norway does not have separate psychiatric forensic hospitals. The referring physician must have seen the patient in person within 10 days prior to hospitalization if the patient's referral is involuntary (Fig. 1).

The referring physician then decides, based on the Mental Health Act, whether a patient should be referred for voluntary hospitalization (VH) (§ 2–1), involuntary observation up to 10 days (§ 3–2) or an involuntary admission with unspecified length of stay (§ 3–1). The involuntary observation § 3–2 requires or a strong suspicion of a severe psychiatric disorder in order to accept the patient for IH, in other words a possible psychotic condition which need further assessment. Involuntary admission § 3–1 with unlimited length of stay requires that the patient has a serious mental disorder (i.e. psychosis) in order to accept the patient for IH. The law also requires at least one of the following additional criteria: there must be an urgent need for treatment and/or life threatening danger to self or others. After the arrival to the hospital's acute ward, IH patients must then be assessed by a psychiatrist (or a physician and a clinical psychologist approved for Mental Health Act decision making) within 24 h in order to make the final decision whether IH is appropriate and fulfills the criteria in the Mental Health Act. This 24 h observation period is used to obtain and evaluate all available information from the referring physician, the patient, the family if available, and sometimes from other sources like psychiatric nurse, home services or county mental health teams, as long as the patient does not deny access to this information. Patients who are referred for involuntary observation may not fulfill the suspicion of a severe psychiatric disorder (i.e. psychosis) and then have to be admitted voluntary § 2–1. A patient referred for involuntary admission § 3–1 may not fulfill the criteria and can either be admitted on observation § 3–2 based on suspicion of a severe psychiatric disorder, or on voluntary basis § 2–1 if no criteria are fulfilled.

The patient has the right to be informed about the ability to complain being IH. Both the referring physician (GP), the resident receiving the patient and the psychiatrist has the responsibility to inform the patient of his/her legal rights. If the patient does complain about IH the patient has a right to free legal service by an independent lawyer. If the patient wants to complain of the decision involuntary admission, the patient can complain to the Supervisory Commission (The Norwegian Social Affairs Committee, 1998–99). This commission consists of and chaired by a lawyer who is qualified to serve as a

judge, physician not affiliated with the hospital, and two other members. In respect of the two latter members, a person shall be appointed who has personally been under mental health care or is or has been a close relative of a patient or who represented the interests of patients in his occupation or function. These two are often representative of a patient's organization and a lay person with education and practice in social welfare. The Supervisory Commission is autonomous in its activity. It can rule out the psychiatrist decision of involuntary admission if they conclude there are not enough criteria for involuntary observation or admission on unlimited time period.

The Norwegian Mental Health Act follows the principles of World Health Organizations checklist for involuntary admission and treatment; 1) evidence of a mental health disorder of specified severity; 2) serious likelihood of doing harm to self or others and/or substantial likelihood of serious deterioration in the patient's condition if treatment is not given; 3) admission is for a therapeutic purpose (World Health Organization, 2005).

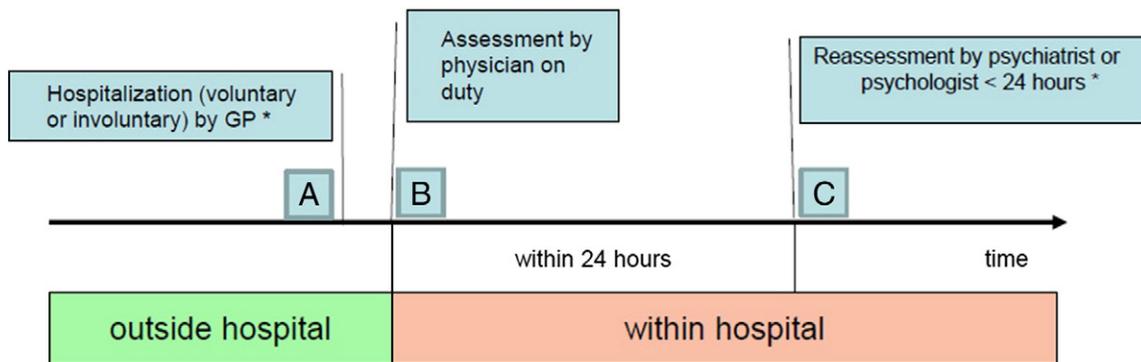
There are similar laws in Nordic countries like Finland (Turunen, Valimaki, & Kaltiala-Heino, 2009) and Denmark (Jepsen, Lomborg, & Engberg, 2010).

In this article we report and analyze clinical, epidemiological and societal factors influencing the referral patterns for IH in psychiatric acute units.

1.3. Review of studies

A literature search was carried out in PUB MED regarding involuntary hospitalization in different countries (key words: Involuntary hospitalization, voluntary hospitalization, acute psychiatric wards, coercion, and mental health legislation). Only studies that report rates of IH for consecutive admissions, and rates of IH per 100,000 inhabitants per year were selected. The focus was to identify studies in which IH are compared with voluntary hospitalization (VH) in order to evaluate what characterizes and predicts the former. In one of the studies outside Europe it was found that at a university hospital emergency room in Pennsylvania, USA, offering community-based inpatient psychiatric services in an urban setting, 10% were IH (Hoge et al., 1997). In a public sector hospital serving one-third of the state of Virginia 80% was IH. Among consecutive admissions to acute psychiatric inpatient services in Auckland, New Zealand, 62% were IH (Wheeler, Robinson, & Robinson, 2005).

In an overview of legislation regarding compulsory admission and involuntary treatment of mentally ill patients in EU-countries the



* Criteria for hospitalization in the Norwegian Mental Health Act.

- I. Discharge
- II. §2-1. Voluntary hospitalization
- III. §3-2. Involuntary observation (max stay 10 days): Criteria: There is a strong suspicion that the patients has a severe psychiatric disorder (i.e. psychosis) and this must be further observed.
- IV. § 3-1. Involuntary hospitalization with no time limit: Criteria: The patient has a serious mental disorder (i.e. psychosis) and there must be an urgent need for treatment and / or life threatening danger to self or others.

Fig. 1. Hospitalization process for involuntary admission in Norway.

percentage of IH for each country was quite stable during the period 1990 to 2000 (Salize, Dressing, & Peitz, 2002). EU-countries except Scandinavia showed an IH range of all admissions from 3.2% in Portugal to 21.6% in Finland. France reported 10.5–12.5% (1988–1999), UK 11.7–13.5% (1976–1999) and Germany between 3.9 and 44.8% in 1978 and 17.7% in 2000. The highest percentage of all of IH occurred in a region of Switzerland with 93% (1982). Lowest was Spain, with 1% IH of all admissions in 1985 (Riecher-Rossler & Rossler, 1993). We regard these huge differences in use of IH between countries as being unlikely and assume that the studies have biased samples.

The Scandinavian countries have different legislation than EU countries, and to some degree between themselves. Public health services are free and cover all citizens. The range in percentage of IH in other Scandinavian countries 1997–2000 varied from 4.6% (Denmark) to 30% (Sweden) (Salize & Dressing, 2004).

In Norway, a comparison of IH in acute psychiatric institutions in Hedmark County and Ullevål sector in Oslo in 1994, showed that Hedmark County had 48% IH while Ullevål sector in Oslo had 85% (Brabrand & Friis, 1997). In a study of three psychiatric hospitals and one psychiatric unit in a general hospital in 3 regions in Norway, 52% were IH (range 27 to 67%) (Iversen, Hoyer, & Sexton, 2009). In the city of Tromsø a study of acute psychiatric admissions from an out-of-hours casualty clinic, found that 59% were referred to IH (Deraas, Hansen, Gjaever, & Olstad, 2006). In a national report for 2001–2006, 35% of all inpatients in Norway were referred to IH (Bremnes, Hatling, & Bjørngaard, 2008, 2010).

We identified only two studies that compared IH with VH. In an Israeli study, IH patients were found to be more often single, male, young and with less education compared to VH (Rosca et al., 2006). In a New Zealand study, IH was associated with male gender and a diagnosis of psychosis and ethnicity (being Maori) (Wheeler et al., 2005).

In summary we found large variations in the use of IH compared to VH. The lowest rate of IH was reported in Spain with 1% (1985) and the highest in Switzerland (1982) with 93%. Studies from other Scandinavia countries varied from 4.6% in Denmark to 30% in Sweden. In Norway, rates varied between 35 and 85%.

1.4. Aims of the study

- To examine to which extent patients admitted to twenty acute psychiatric ward units in Norway were referred on an involuntary basis.
- To compare involuntary referred with voluntary referred patients.
- To describe which factors predicted use of referral for IH.

1.5. The following hypotheses were based upon relevant literature

- The level of IH was expected to be about 35% based on the most recent national report from Norway.
- IH patients were expected to be single, male, presented by police, with lower levels of education and more often non-Norwegians.

2. Materials and methods

2.1. Design

Data was collected from all consecutive hospitalizations during three months at twenty acute psychiatric units in Norway during the fall 2005 and early 2006 (Ruud, Gråwe, & Hatling, 2006). The twenty participating health trusts represented all geographical regions in Norway, and 75% of all acute wards in the country. The remaining wards are to our knowledge not different regarding urban or rural characteristics.

2.2. Subjects

Altogether 3506 hospitalizations were registered. As the result of incomplete data regarding IH, 180 cases were excluded. Four admissions based on child protection law or a social law of involuntary admission was coded as IH. The final data set for analyses was thus 3326 cases. In this study the units mainly received patient age 18 or above. However, 29 patients aged 15–17 were included since not all hospitals in Norway had acute adolescent units available and adult acute psychiatric emergency units could not reject patients seeking admission. Patients referred for involuntary observation up to 10 days (§ 3–2) or involuntary hospitalization with unspecific length of stay (§ 3–1) was coded as IH.

There were no exclusion criteria.

2.3. Methods

Data were collected by psychiatric health professionals including psychiatric nurses, nurses and nurse assistants, admitting psychiatrists and clinical psychologists. Personnel received training sessions for use of the Global Assessment of Functioning (GAF)-scale (American Psychiatric Association, 1987; Wing et al., 1998; Wing, Curtis, & Bevor, 1999) and Health of the Nation Outcome Scales (HoNOS) through discussions and scoring of vignettes. Every site had a local project coordinator. Data was collected, anonymized and transferred to a central database for the study.

2.4. Instruments/materials

For general sociodemographic description we used an admission registration form for acute psychiatric wards developed for this study (Ruud et al., 2006). The date and time of day for the admission was described, as well as acute admission (whether or not the patient could wait another day to be assessed), referral agency, referral status (voluntary/involuntary), being followed by police, and patient's request for acute admission and previous contact with mental health agencies. If previously admitted, the last level of care, elective or acute hospitalization was described. The following demographic data was collected: date of birth, gender, ethnicity, being parent for children less than 18 years of age, care of children status, living accommodations, source of income, psychiatric problems, educational level and service deliveries prior to admission.

We used the Global Assessment of Functioning Scale (GAF) axis IV in DSM-IV, and the scores were split into symptom (GAFs) and function (GAFf) scores (American Psychiatric Association, 1987; Goldman, Skodol, & Lave, 1992).

Health of the Nation Outcome Scales (HoNOS) was used to rate severity of psychiatric problems. HoNOS consist of 12 items measuring behavior, impairment in cognitive function, symptoms and social functioning (Wing et al., 1998, 1999): 1 overactive, aggressive disruptive or agitated behavior, 2 non-accidental self-injury, 3 use of alcohol or drugs, 4 cognitive problems, 5 physical illness or disability problems, 6 problems associated with hallucinations and delusions, 7 problems with depressed mood, 8 other mental or behavioral problems (phobic, anxiety, obsessive-compulsive, mental strain/tension, dissociative, somatoform, eating, sleep, sexual or others), 9 problems with relationships, 10 problems with activities of daily living, 11 problems with living conditions and 12 problems with occupation and activities. The scale used the following scores; 0 (no problem), 1 (minor problem which do not need action), 2 (mild problem but definitely present), 3 (moderately severe problem) to 4 (severe to very severe problem).

2.5. Ethical considerations

The study was approved by the Regional Ethical Committee in Eastern Norway (no. 04049), and Norwegian Social Science Data

Table 1
Demographics of patients with voluntary or involuntary hospitalizations to 20 acute psychiatric units in Norway.

	N	Voluntary hospitalization				Involuntary hospitalization				p-value
		Mean	n	S.D.	%	Mean	n	S.D.	%	
Age	3322	38.9	1869	14.5		40.4	1453	16.8		0.0005
Gender; male	3321		906		48.5		784		53.9	0.002
Country of origin	3291									
–Norwegians			1684		90.9		1264		87.9	0.006
Marital status	3252									
–Unmarried			954		51.9		838		59.3	0.0005
–Married/divorced/separated/widowed			884		48.1		576		40.7	
Highest level of education	3069									
–Obligatory (1–10)			873		50.3		728		54.7	0.016
–High school/university			864		49.7		604		45.3	
Living situation, living alone	3259		958		52.3		728		50.9	0.727

Service and The Norwegian Data Inspectorate under the Norwegian Ministry of Labour and Government Administration, NSD (no. 11074).

2.6. Statistical analyses

Analyses were made with the statistical package SPSS (version 17.0) (SPSS, 2006). The sample was divided into voluntary hospitalization (VH) and involuntary hospitalization (IH). Descriptive statistics were used to calculate the mean and standard deviation (SD), t-test and Chi-square test were used for testing significance of differences between IH and VH. Logistic regression was used in the analyses of predictors for IH logistic regression was used.

Due to the large data set many factors may be identified and complex models may be well estimated. But the focus here was on the main effects highlighting the most important trends in the data. Such a parsimonious model may be viewed as an approximation to a more elaborate model for the data. The validity of such an approximation may be checked via goodness of fit measures and residual diagnostics. To achieve this stepwise variable selection techniques with strict criteria ($p\text{-in} = 0.01$, $p\text{-out} = 0.02$) were used to include a variable in the model. Forward and backward variable selection procedures were used to single out the statistical most important predictors. Initially 32 different prediction variables were candidates for inclusion. Both procedures gave very similar results and the model showed good fit according to the Hosmer–Lemshow statistic and residual analysis.

3. Results

We found that 1453 (44%) of the patients were referred for IH. Of all patients included, 28% were referred for involuntary observation (maximum duration 10 days) and 16% for involuntary hospitalization with no time limit for stay. IH patients were older, more often male, more often of non-Norwegian origin, unmarried and had lower level of education (Table 1).

IH patients were admitted more often during evening and night-shifts, were not referred from their family doctor, and the referral agency did not know the patient. They were more often brought to hospital by the police, did not want to be hospitalized, had fewer previous contacts with psychiatric services and had less responsibility for children (Table 2). Many of the IH patients who had children did not seem to need public assistance or support for their children. IH patient had less often their income from paid work or sickness benefit.

IH patients had higher mean HoNOS scores on overactive, aggressive, disruptive or agitated behavior, cognitive function, hallucinations and delusions, problems with relationship with others and problems with activities of daily living (Table 3). Altogether 62.4% of the VH and 59.7% of the IH were reported to have deterioration or relapse of a more chronic psychiatric illness as reason for referral. Regarding reasons for being hospitalized by GP we found no differences between patients with recent debut of psychiatric illness, new period of the psychiatric disorder or deterioration of the psychiatric disorders. IH patients had lower scores on GAF symptom and GAF function at intake.

Table 2
Characteristics at referral process of acute patients admitted to 20 acute psychiatric units in Norway.

	N	Voluntary		Involuntary		p-value
		n	%	n	%	
Admission, evening or night (19 to 07)	3132	615	35.7	613	43.5	0.0005
Referral not from family doctor/GP	3326	1443	77.2	1187	81.5	0.0020
Referral source did not know the patient	3301	989	53.4	913	63.1	0.0005
Transported by police	3317	152	8.1	706	48.7	0.0005
No previous contact with psychiatric services	3197	354	19.5	376	27.2	0.0005
Regarding children	2797					
–No care		1268	79.3	1034	86.3	0.0005
–Partly care		112	7.0	64	5.3	
–Full care		219	13.7	100	8.3	
Need public help for children	958					0.0005
–No need		315	49.6	112	34.7	
–Need given		127	20.0	77	23.8	
–Uncovered need		15	2.4	17	5.3	
–Unknown		178	28.0	117	36.2	
Income source	3316					0.0005
–Paid work/sickness benefit		569	30.5	283	19.6	
–Rehabilitation funds/disability pension		790	42.3	629	43.4	
–Social benefit		377	20.4	389	26.9	
–Student loan		47	2.5	34	2.3	
–Retirement pension		84	4.5	114	7.9	

Table 3
Symptoms of patients admitted to 20 acute psychiatric units in Norway.

	N	Voluntary			Involuntary			p-value
		Mean	n	S.D.	Mean	n	S.D.	
GAF at intake	3266							
Symptoms		38.77	1843	11.35	31.88	1423	12.28	0.0005
Function		40.02	1843	10.80	34.69	1423	11.73	0.0005
HoNOS variable								
Problems with:								
Overactive, aggressive disruptive or agitated behavior	3201	0.61	1822	0.992	1.46	1379	1.36	0.0001
Non-accidental self injury	3191	1.03	1818	1.344	0.86	1373	1.352	0.712
Drinking or drug taking	3171	1.06	1809	1.415	1.15	1362	1.501	0.0001
Cognitive	3154	0.72	1806	0.979	1.20	1348	1.279	0.0001
Physical illness or disability problems	3187	0.66	1816	1.073	0.68	1371	1.088	0.301
Hallucinations and delusions	3179	1.00	1812	1.277	1.86	1367	1.495	0.0001
Depressed mood	3179	1.91	1818	1.149	1.29	1361	1.267	0.0001
Relationships	3166	1.67	1804	1.144	2.02	1362	1.237	0.432
Activities of daily living	3166	1.44	1807	1.136	1.73	1359	1.287	0.0001

We carried out a logistic regression analysis in order to examine what predicts IH. Thirty-two variables were entered including age, gender, intoxication status at admission, referred agency, marital status, living accommodations, source of income, level of education, GAF score, contact with health sources last 48 h, HoNOS, use of drugs and alcohol and suicidal status before admission in a stepwise variable selection. Some variables were clearly insignificant while some were at border level.

Table 4 shows the significant results. The odds ratio for IH was 3.72 if the patient had contact with police during the referral process entering the acute psychiatric units, 1.50 if the patient was referred from someone who did not know or followed up the patient, 1.48 if the patient had other unspecified contacts before referral. The odds ratio for IH was 1.46 if the patient did not live in his/her own house or apartment. The odds ratio for IH increased by factor 1.39 per unit increased score on aggression on the HoNOS scale and by factor 1.20 per unit increased score on hallucinations and delusions on the HoNOS scale.

The odds ratio was 1.19 if the patient had contact and support with the out-of-office clinic within 48 h before admission, and the OR increased by a factor of 1.11 per unit increased score if the patient had self-harm on the HoNOS scale and by a factor of 1.10 of increased

Table 4
Predictors of involuntary hospitalizations (IH) to 20 acute psychiatric units in Norway.

Predicting factors	OR ^a	p-value ^b	95% C.I. for OR ^a	
			Lower	Upper
Contact with police	3.72	0.000	2.80	4.94
Referred from someone who did not know or followed up the patient	1.50	0.000	1.23	1.83
Other contact within the last 48 h	1.48	0.020	1.15	1.90
Living in other less stable housing conditions than living in own apartment or house	1.46	0.000	1.21	1.76
HoNOS aggression	1.39	0.000	1.29	1.50
HoNOS hallucinations and delusions	1.20	0.000	1.13	1.29
Contact last 48 h with out-of-office casualty clinic	1.19	0.090	0.97	1.44
HoNOS self-harm not by accident	1.11	0.005	1.03	1.20
Age, 10 years	1.10	0.001	1.04	1.17
HoNOS ^c reduced mood level	0.87	0.000	0.80	0.94
Passive suicidal thoughts, no active plans	0.45	0.000	0.36	0.56
GAF ^d symptoms at intake (log)	0.35	0.000	0.27	0.44
Constant	11.14	0.000		

^a Odds ratio.

^b p-value 0.000 means less than 0.0005.

^c Health of the Nation Outcome Scales.

^d Global Assessment of Functioning.

age (per 10 years). The OR decreased by a factor of 0.87 with increased score of “reduced mood level” on the HoNOS scale and by a factor of 0.45 with increased score of “passive suicidal thoughts and no active plans”. Increase in GAF symptoms score (log transformed) decreased the OR for IH by a factor of 0.35 per unit.

4. Discussion

4.1. Involuntary hospitalization

In this large epidemiological study of hospitalization in twenty psychiatric acute units representing about 75% of all acute emergency units in Norway, it was found that 44% were involuntarily hospitalized (IH). In an earlier study of three psychiatric hospitals and one general hospital with an acute psychiatric unit in Norway (1997 to 1998), 51.7% were involuntary referred (Iversen et al., 2009). In another study of acute emergency admissions in Tromsø, 59% were involuntary referred (Deraas et al., 2006). In a Norwegian national report of all psychiatric units who receive involuntary admissions in 2006, only 35% were involuntary referred (Bremnes et al., 2008). Our results are in between these findings, but the national report includes both acute admitted patients and elective admitted patients. The Tromsø study only looked at patients referred from an out-of-hours clinic, but did not include patients referred directly from a GP during normal practice hours. This may have influenced the result of a rather high level of IH in Tromsø since it included what we now see as predictors of IH; followed by contact with police, the referring physician probably did not know the patient and admission took place at evenings and nights. In this study 28% of all patients were referred for involuntary observation (maximum duration 10 days) and 16% for involuntary hospitalization with no time limit for stay. In the Norwegian national report 2001–2006 there was a range from 54 to 42% referred for involuntary observation and 34–33% for involuntary hospitalization with no limit for length of stay (Bremnes et al., 2008). Voluntary hospitalized patients increased from 11% in 2001 to 24% in 2006. From our study we can see that there was a higher percentage of VH, but this study includes only acute emergency admissions, while the national report also includes elective admitted patients.

4.2. Age

In our study the mean age of IH was 40.4 years and for VH 38.9 years. In the Norwegian study from Tromsø Casualty Clinic the mean age 32 was years, but they were not divided into IH and VH concerning age (Deraas et al., 2006). In the New Zealand study the median age of the 932 patents included were 34 years (range 16–68) (Wheeler et al., 2005).

4.3. Gender

In our study 53.9% involuntary referred patients were males. In a Norwegian national review (in 2006) males constituted 50.4 of those involuntary admitted (Bremnes et al., 2008). In the New Zealand study 56% of all patients were males, and 67% of males and 56% of females were involuntary admitted (Wheeler et al., 2005). In a Norwegian study 55% were males (Deraas et al., 2006), and in another study 47% were males (Iversen et al., 2009). There was no distinction between voluntary and involuntary referred males in these two studies. In an Israeli study in 1991, 64.7% of first time involuntary admitted patients were males (Rosca et al., 2006). In a Dutch study, more males than females (21% men and 15% women) were involuntary admitted (van der Post et al., 2009). Males seem to be more at risk in all these countries to be IH.

4.4. Country of origin

In 2005 there was 7.51 present inhabitants with another ethnicity than Norwegian (Statistics, 2006). In our study there were 325 patients (9.8%) with another national ethnicity than Norwegian. Within this group 13.5% came from other Nordic countries, 14.8% from Europe, 39.7% from Middle-East, 11.7% from Asia, 0.3% from Australia/Oceania, 2.5% from the American continent, and 15.1% from the African continent and 2.5% were adopted to Norway. Of the IH 12.1% had a different nationality than Norwegian compared to 9.1% of VH. In the Netherlands it was found that first and second generation immigrants from non-Western countries had a higher risk of contact with psychiatric emergency services and compulsory admission than native Dutch population (Mulder, Koopmans, & Selten, 2006). The association between non-Western ethnicity and compulsory admission was supported by greater severity of psychiatric symptoms, greater level of threat, more lack of treatment motivation and a lower level of functioning. In a study from Denmark, more immigrants were admitted involuntarily than Danish-born psychiatric patients (Norredam, Garcia-Lopez, Keiding, & Krasnik, 2009). The ethnicity cohort of the New Zealand study represented European 60%, Maori 23%, Pacific nations nearly 11%, Asian 4% and others 1% (Wheeler, 2005). Norway has so far a more homogeneous population than other countries, but received more people seeking asylum and labor immigration in the last 20 years.

4.5. Marital status

In our study 59.3% of involuntary were unmarried. In a Norwegian study 43% of all voluntary and involuntary were unmarried (Deraas et al., 2006), and in an Israeli study in 1991, 48.7% of first time involuntary admitted patients were single (Rosca et al., 2006). Patients with severe psychiatric symptoms, and some rather young may have more difficulty in establishing a stable relationship. When we add that they may not have their own house or apartment, living on rehabilitation funds or disability pension, a married or stable cohabitation status may be more difficult to achieve.

4.6. Level of education

In our study 54.7% of involuntary and 50.3% of the voluntary referred patients had only obligatory 10 years of education. In the Norwegian general population (year 2006) only 21% had lower secondary education as their highest academically level. In OECD countries average 31% have lower secondary education (Statistics Norway, 2006). This shows that patients admitted in our study had a lower level of education than the general population both in Norway and OECD countries. In an Israeli study, 22.9% of first time involuntary admitted patients had 8 years of education, 41.8% 9 to 12 years of education and 16.8% 13 or more years of education (Rosca et al., 2006). Norwegian Statistical Central Bureau yearbook 2007 showed that 87% aged 25–64 in 2004 had fulfilled minimum high school level. About 33% had fulfilled

university or college level. Involuntary hospitalized patients had a lower level of education maybe because the debut of a major psychiatric illness could have blocked further education. We do so far not know how much an IH may affect the patient's process to get more education. This could be influenced by number of IH, length of stay in the hospital, and the ability for the patient to successfully return to educational institutions after hospitalization.

4.7. Living situation, living alone

In our study 50.9% of IH and 52.3% of VH lived alone. When we asked them what kind of housing situation they were in, 67.7% of all patients had their own house/apartment, 0.9% lived in communal apartment without milieu personnel around, 5.3% lived in communal apartment with milieu personnel around, 3.4% in communal apartment with milieu personnel available 24 h/7d, 4% lived in an institution, 9.8% lived with their parents, 1.1% lived at a hospice, 3.8 did not have any place to stay at all, 1.4% at an asylum center for foreigners, 0.8% in a prison, and 1.7 with unknown housing situation. Of those having their own home, 30.3% were IH. In an Italian study it was much more frequent that patients lived with their family, and the involuntary admitted patient were more frequent young male schizophrenic patients living with their family of origin. Much of the 460 cases were not working at the time of admission (Zeppegnò et al., 2005).

4.8. Drug use

This study showed that IH was significantly influenced by the use of alcohol or drugs during the last six months. When the material was divided between no abuse, abuse and dependency, 26.6% of IH and 22.3 of VH abused or had a dependency on alcohol or drugs at admission. In a Norwegian study of first episode psychosis patients with substance abuse there was significantly higher risk for IH during follow up (OR 5.2) (Opsal et al., 2011). In the Norwegian study of an out-of-hours clinic 40% of the patients had a history of substance abuse (Deraas et al., 2006). The current study shows that 24.2% of all patients reported substance abuse. One reason less substance abuse was found may be the higher number of cases in this study.

4.9. Predictors of involuntary admission

The findings in this study showed that the strongest predictors of IH were the following: the patient had contact with police during the referral process, referred by someone with no knowledge of the patient, other contact with health or social services prior to admission, not living in an apartment or own house, a high score on aggression, hallucinations and delusions, contact with an out-of office casualty clinic within the last 48 h, and the patient had a poor GAF symptom score at intake. No studies have been found in the literature to compare these results.

4.9.1. Contact with the police

One study reported that VH patients bring themselves to the hospital for treatment, while IH patients are brought to the hospital in the custody of others who seek their treatment (Hoge et al., 1997). In our study the police was in contact or transported the patient to hospital in 8% of the VH and 49% of the IH patients. Altogether 25.9% of all patients in our study were transported by the police to the acute psychiatric unit. The police in Norway are normally contacted when the patient is in an unstable, aggressive or otherwise insecure state. In these cases, the police are the only agency that can by force transport a patient to the acute psychiatric unit. Our findings correspond well to a Norwegian study which reported that 34% of all patients were accompanied by police, 24.4% of VH and 40.7% of IH patients (Deraas et al., 2006). However, this study only included 100 patients referred from an out-of-hours clinic (located on a county level in the Norwegian health system). In a

study of 70 involuntary hospitalizations in Tübingen, Germany 21% were brought to the hospital by the police on doctors' court hold (Laengle, Durr, Renner, Guenther, & Foerster, 2000).

4.9.2. Physician who referred did not know the patient

In Norway every citizen has their own GP. We could then expect that a high percentage of admitted patients were referred by their GP who knew them from before. Too few patients in this study are referred from their family physician. Of involuntary admitted patients 63% were referred by someone who did not know the patient. This was the second strongest predictor of IH, challenging the psychiatric services that knowledge of the patients' psychiatric history may reduce IH in the future. Contact with an out-of office clinic the last 48 h was also a predictor of IH. The out-of office clinic is often staffed by GP's, physicians working in hospitals or physicians working on shorter contracts with the county health services. They work under pressure during evenings and nights and often do not have a long time relationship with the patients in an acute state. They have to decide on a short time basis, often based on one appointment only, if the patient has to be admitted or not. This aspect gives them less knowledge and time to make a good and qualified conclusion for IH or VH.

4.9.3. Living accommodations

Living accommodations status for the psychiatric patient is important. We grouped together all other housing status i.e. all kinds of rented service apartments from the county with or without staff visiting the patient, living in an institution, living with parents or others, hospice or without any place to live at all. A clear predictor of involuntary hospitalization was if the patient did not live in his or her own apartment or house.

4.9.4. Symptoms of aggression, hallucinations and delusions

A high score on HoNOS aggression predicted IH. Aggressive behavior often will lead to the need of police in an admission process. Sometimes psychotic symptoms with hallucinations and delusions are a part of the psychiatric symptom picture of the patient. In our study there was a higher OR for aggression, hallucination and delusion which corresponds to the psychotic symptoms in the New Zealand study (Wheeler et al., 2005). In the New Zealand study IH patients were associated with male gender, a diagnosis of psychosis and ethnicity (being Maori). We found that IH were older, more often male, of non-Norwegian origin, unmarried and had lower level of education. This result corresponds with the Israeli study where IH patients were more often single males between ages of 18 and 44, and had poor levels of education (Rosca et al., 2006).

4.9.5. Symptoms of reduced mood level and self-harm not by accident and GAF

The OR decreased with an increase in score of "reduced mood level" and more intense suicidal behavior. This could express that more depressed patients often are VH. Increase in GAF symptom score decreased the OR for IH. This conclude that patients with a low GAF score at intake had severe psychiatric symptoms and were less likely to be involuntary admitted to Norwegian acute psychiatric units.

4.10. Patient wanted voluntary admission

After the patients had entered the acute psychiatric unit for hospitalization they were asked whether they wanted admission or not, independent of their referred legal status. It was found that 96.5% of VH and 29.7% of IH stated that they actually wanted admission.

In the study from Pennsylvania and Virginia USA, 81% of IH reported that they were not offered the opportunity to voluntarily enter the hospital, 56% of whom indicated they would have entered voluntarily had the offer been made (Hoge et al., 1997). In a questionnaire testing the

patient's understanding of the admission process, 56% of the VH and 19.3% of the IH had thoughts of voluntary admission. This may reflect the possibility to reduce the level of IH. On the other hand, patients who are admitted involuntarily but state that they actually want voluntary admission may also be clinically unstable, ambivalent and have poor insight. They may change their willingness to be voluntarily admitted when they reach the acute psychiatric unit, or during the period of admission process.

4.11. Source of income

In our study 25.7% had paid work, while 42.8 had rehabilitation funds/disability pension and 23.1% had other social benefits. Of the IH patients 26.9% had their income source from social benefits and 19.6% had paid work/sickness benefits, while the VH patient 20.4% had as income source social benefits and 30.5% were on paid work/sickness benefits. Many of the VH and IH patients were on disability pension (42.3 and 43.4%). In the Tromsø study 32% were economical supported by various benefit systems and 7% were employed (Deraas et al., 2006).

These two studies show that a high percentage of acute psychiatric patients in Norway got some kind of social security payments.

In order to control for possible random effects of different psychiatric centers we have rerun the model using a hierarchical procedure (R, Imer) with center as a random effect. This resulted in only minor changes in the estimated OR's (practically all within 10%). No changes in the overall results were seen.

5. Limitations

A limitation in this study was that catchment areas differ in population density. One patient may have had multiple admissions and could differ in involuntary or voluntary status when referred. There were multiple raters, because patients were admitted continuously to the units over twenty four-hours, seven days a week. Some raters did not fill in answers to all questions since some data were not always available in the acute admission process. There was no intersite reliability test on GAF and HoNOS.

6. Conclusions

Predictors of IH in acute psychiatric units are contact with the police, referred from someone who did not know the patient, had symptoms of aggression, hallucinations and delusions and a low GAF score at intake, and were admitted during evening and nights with frequent substance abuse.

Forty-four percent of all psychiatric admissions were IH. This result was in the middle compared to other studies. Few of the other studies are naturalistic with such a large number of patients included. Health systems need to consider better pathways to care.

Our data seems to support the idea that most patients IH where in need of treatment. We do not know to which degree use of IH could be prevented, however; it is the explicit goal for the Norwegian Health Authorities to reduce IH. We believe the first step to achieve this must be a solid knowledge. Descriptive studies like ours, is at least a good starting for such processes.

Conflict of interest

None.

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