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Characteristics of patients frequently subjected to pharmacological and mechanical restraint—A register study in three Norwegian acute psychiatric wards

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ABSTRACT

This retrospective study from three catchment-area-based acute psychiatric wards showed that of all the pharmacologically and mechanically restrained patients ($n=373$) 34 (9.1%) had been frequently restrained (6 or more times). These patients accounted for 39.2% of all restraint episodes during the two-year study period. Adjusted binary logistic regression analyses showed that the odds for being frequently restrained were 91% lower among patients above 50 years compared to those aged 18–29 years; a threefold increase (OR=3.1) for those admitted 3 times or more compared to patients with only one stay; and, finally, a threefold increase (OR=3.1) if the length of stay was 16 days or more compared to those admitted for 0–4 days. Among frequently restrained patients, males ($n=15$) had significantly longer stays than women ($n=19$), and 8 of the females had a diagnosis of personality disorder, compared to none among males. Our study showed that being frequently restrained was associated with long inpatient stay, many admissions and young age. Teasing out patient characteristics associated with the risk of being frequently restraint may contribute to reduce use of restraint by developing alternative interventions for these patients.

1. Introduction

Studies of factors related to use of restraint in psychiatric institutions are important because restraint devices potentially are risky and can harm the patients (Mohr et al., 2003; Hatta et al., 2007; Strout, 2010). Such use may discourage patients from seeking future help even when they feel in need of it (Smith, 1995).

Over the last decade, there has been an increase in number of studies on several aspects in this area, but few studies have put focus on patients who are frequently subjected to restraint. This has called for more investigations to identify variables related to a greater probability of being frequently secluded and restrained (Dumais et al., 2011; Whitehead and Liljeros, 2011) and to study restraint related to the individual patient (Janssen et al., 2011).

To the intention of using restraint is to confine the patients' movements: There are different types of restraints: mechanical restraint (e.g. different types of belts), physical restraint (holding the patient by force) and pharmacological or chemical restraint (the use of medication to sedate or calm the patient. This is not the same as pharmacological treatment. Seclusion refers to detention of a patient in a locked room.

A literature search for empirical research on rates of and rationale for multiple restraint episodes in the Ovid Medline and Psych Info databases from 1946 to May 2012 identified a total of eight studies. They were from the time period 1993 to 2006, and the observation periods varied from 1 month to 4 years. Patients with several episodes of restraint were defined differently in the studies. A common finding was that the distribution of episodes of seclusion and restraint (S/R) were skewed, with a small proportion of patients accounting for a large proportion of episodes. Five of the studies included both seclusion and restraint (Korkeila et al.,

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2002; Calkins and Corso, 2007; Beck et al., 2008; Hendryx et al., 2010; Whitehead and Liljeros, 2011) and three only covered restraint (Porat et al., 1997; (Whitman et al., 2001; Sercan and Bilici, 2009). The following patient characteristics were associated with a high number of episodes of restraint: age (Porat et al., 1997; Calkins and Corso, 2007; Beck et al., 2008); gender (Porat et al.,1997; Beck et al., 2008; Sercan and Bilici, 2009); diagnosis (Korkeila et al., 2002; Beck et al., 2008; Hendryx et al., 2010); length of stay (Calkins and Corso, 2007; Hendryx et al., 2010); previous admissions (Korkeila et al., 2002; Hendryx et al., 2010); legal status by admission (Korkeila et al., 2002). Only three of the studies had included more than 2 of these variables in multivariate designs (Korkeila et al., 2002; Beck et al., 2008; Hendryx et al., 2010). One study limited the research focus to admissions to the hospital and not patients as the unit of analysis (Korkeila et al., 2002).

Most of these studies were from mixed psychiatric facilities and populations. Only two were conducted in acute inpatient psychiatric settings (Calkins and Corso, 2007; Whitman et al., 2001). The methodological differences between the studies make it difficult to synthesize the findings, but some tentative conclusions may be drawn: (1) few studies exist in this area; (2) these patients constitute a small proportion (4.6–10.4%) of the total sample of restrained patients, but account for a large proportion of the episodes (48–71.8%), and (3) patient characteristics like lower age and higher numbers of admissions are more frequent among patients with many episodes of restraint. Results concerning gender differences and diagnosis were inconclusive. From these studies and our own previous study where we compared restrained and non-restrained patients (Knutzen et al., 2011), we expected that frequently restrained patients would be characterized by longer hospitalizations, more admissions, involuntary admissions and having one of the following ICD-10 diagnoses: a substance use disorder, schizophrenia or a related psychotic disorder, or a bipolar disorder. To find out each variables impact on restraint use we included all these variables in a multivariate design.

1.1. Aims of study

(1) To estimate the proportion of patients frequently restrained (either pharmacologically, mechanically or both). (2) To compare frequently restrained patients and patients with lower rates of restraint on (a) clinical variables such as; diagnosis, legal basis of referral, length of stay and number of admissions, and (b) socio-demographic variables such as; age, gender, immigrant background and whether they live in the catchment areas of the institutions or not. The scope of the comparison is to explore if these characteristics are associated to frequent restraint use. Identifying patient demographics associated with frequent restraint may enhance the possibility to identify patients belonging to this subgroup. This allows for early intervention strategies to prevent future use of restraint.

2. Methods

The Norwegian Directorate of Health, the Regional Ethical Committee, and the Data Inspectorate approved the study. As the study was retrospective and based on register data only, the Norwegian Directorate of Health waived the need for informed consent.

2.1. Setting

The study included all restrained patients admitted to the acute psychiatric wards of three Norwegian hospitals during a 2-year period from January 1, 2004, through December 31, 2005. The treatment system for all patients was catchment-area based and publicly funded. The total number of beds in the acute wards was 80.The catchment area of one of the acute wards was a part of Oslo, the capital city, whereas the two others covered both urban and rural areas. Altogether, the catchment areas had 570,000 inhabitants.

2.2. Study sample

During the 2-year period 2004–2005, 3365 patients were admitted to the three psychiatric acute wards. Of those, a total of 375 patients were subjected to "restraint procedures". This is the third study from this patient sample. The first was a case-control study comparing patients restrained with a random sample of non-restrained patients (Knutzen et al., 2011). The second study was based on the restrained patients' first episode of restraint and aimed to explore *how* and *why* mechanical and pharmacological restraint were used (Knutzen et al., 2012). In this study patients subjected to seclusion only ($n=2$), were excluded from the study due to the low number. The remaining 373 patients were included. We do not know if any of the patients have been subjected to restraint before 2004 or after 2005. Patients who were inpatients during 2004–2005 with at least one episode of restraint were included in the study. Neither were patients excluded if they were admitted before 2004 if they were subjected to restraint in 2004, nor were episodes of restraint received in 2006 by patients admitted in 2005 included. For detailed information about the included patient sample, see Table 1.

The Mental Health Care Act (1999) regulates the practice of restraint procedures in Norway. Indications for its use are to prevent patients from injuring themselves, assaulting others, or damaging buildings and physical objects. Restraint can be used regardless of the patient's legal status when she or he was admitted to mental health care. However, "restraint procedures" are not to be seen as a part of the treatment plan. Less restrictive interventions must first have proven unsuccessful, and the use of restraint should be as limited as possible. The "restraint procedures" in the Act are mechanical restraints, pharmacological restraints, and seclusion (locked). *Mechanical restraint* refers to different types of belts (for restraint in bed or outside of bed for arms and feet only). *Pharmacological restraint* refers to single doses of medications that have an anesthetic or sedative effect, and are given by injection or taken orally, either used alone or when the patient is already mechanically restrained (concomitant pharmacological restraint). *Locked seclusion* refers to detention for a short period (up to 2 h) behind locked or closed doors without a staff member present. According to the Mental Health Care Act, Norwegian psychiatric institutions are required to document each episode of seclusion and restraint and to describe the reason, type, and duration of the restraint. *Physical restraint* that refers to holding a patient by using force was not included in this study, because it was not yet defined and regulated as a "restraint procedure" in Norway at the time the study was conducted.

2.3. Materials and procedure

The investigation was based on routinely collected data from patients' files and from hand-written restraint protocols. Data were first coded into a data form at each of the three psychiatric departments and then merged into one common data form (Knutzen et al., 2011). From this database, we extracted data about the type (s) of restraint and number of episodes of restraint each patient had been subjected to during the study period.

The following data were collected from electronic patient files: age, gender, admission date, length of stay, legal status by referral (voluntary or involuntary), classification of primary diagnosis according to Classification of Mental and Behavioral Disorders (ICD-10, 1993), residence in the catchment area (yes or no), number of admissions during the study period, and immigrant background (both parents of non-Norwegian origin, yes or no). The variables length of stay, legal status by referral, and ICD-10 diagnosis were all collected from the first inpatient stay during which a patient was subjected to restraint. Length of stay was merged into three categories: 4 days or fewer, 5–15 days, and 16–279 days. The categories for number of admissions were 1, 2, and 3–23.

Data concerning restraint were retrieved from the restraint protocols for each patient. Types of restraint were classified into three groups: mechanical restraint only, mechanical restraint with concomitant pharmacological restraint, and pharmacological restraint only. Since the only two secluded patients were excluded from the study seclusion were not included as a "restraint-category." Three episodes of restraint had insufficient information to link them to individual patients and were therefore excluded from the study. The reasons reported for restraint were categorized by consensus between two of the authors, according to the definitions in the Norwegian Mental Health Act (The Mental Health Care Act): (1) self-injury (occurred or imminent self-injury); (2) assault (occurred or imminent physical assault towards others); (3) damage (occurred or imminent damage to buildings/physical objects). Some of the reported reasons did not directly match any of these three categories from the Mental Health Act. Therefore we constructed a residual category: (4) miscellaneous reasons, which included agitation (restlessness, loss of control) and somatic conditions or vaguely described reasons (Knutzen et al., 2012). An episode of restraint could be legitimized by one, two or all three of the specific categories above. The total number of reasons is therefore higher than the total number of episodes of restraint.