



## Seasonal variation of hospital violence, seclusion and restraint in a forensic psychiatric hospital



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### ABSTRACT

Several epidemiological studies have reported seasonal patterns in both violent and self-destructive behaviour. However, a few studies on hospital violence have found contradictory results. The aim of this study was to investigate whether there was any seasonal variation of violence in a forensic psychiatric hospital providing care for persons suffering from psychotic disorders and violent or self-destructive behaviour. Seasonal variation of the prevalence of seclusion and restraint was also investigated. Reports of violent incidents and seclusion and restraint statistics from between 2007 and 2012 were examined with Poisson regression analysis. There was significant variation in the prevalence of seclusion and restraint between months ( $p < 0.001$ ), and between seasons ( $p < 0.001$ ). Monthly prevalence of seclusion and restraint was the lowest in January compared to other months. In comparison, the prevalence of seclusion and restraint was lower in winter than in other seasons. In a hospital with persons suffering from psychotic disorders, no significant variation of violence or self-destructive behaviour was found, similarly as in the society. By contrast, the prevalence of seclusion and restraint showed marked seasonality. Variation in the prevalence of seclusion and restraint was not consistent with the variance in violence, which implies that the use of coercive measures is related to seasonal variation among staff.

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### 1. Introduction

Violence is defined as the use of physical force which is intentional and targeted by the person against himself or herself or another person. Violence results in, or has a high likelihood of causing, injury, death or psychological harm (WHO, 2014). Violent incidents in inpatient settings usually lead to limitations in patients' fundamental rights during involuntary treatment if the patient or staff cannot otherwise control the patient's violent behaviour. In Finland 'a patient may be isolated from other patients against his or her will if: 1) the patient would, on account of his or her behaviour or threats, probably harm him/herself or others; 2) the patient by his or her behaviour seriously hampers the treatment of other patients or seriously jeopardises his or her own safety or would probably cause significant damage to property, or 3) it is necessary to isolate the patient for other, especially weighty therapeutic reasons' (Mental Health Act, 1990). A patient may be restrained only in the

case of fulfilment of the conditions named in 1) (Mental Health Act, 1990). In the present study, pursuant to of the Finnish Mental Health Act's (1990/1116) criteria for seclusion, violence was defined as actual violent behaviour performed by patients and targeted towards oneself or other people, and also towards objects. The Constitution of Finland affirms that everyone has the right to privacy and security (Repo-Tiihonen, Putkonen, & Tuppurainen, 2012). During the course of involuntary psychiatric treatment, only those exemptions stipulated in Mental Health Act are allowed (Repo-Tiihonen et al., 2012).

Seasonality in violent behaviour has been reported in several studies, but many of these have been published two or three decades ago. Most of the studies have focused on criminal behaviour (McDowall, Loftin, & Pate, 2012; Morken & Linaker, 2000a; Tiihonen, Räsänen, & Hakko, 1997) or suicidal behaviour (Christodoulou et al., 2009; Hakko, Räsänen, & Tiihonen, 1998; Jia & Zhang, 2011; Preti & Miotto, 2000; Räsänen, Hakko, Jokelainen, & Tiihonen, 2002; Simkin, Hawton, Yip, & Yam, 2003; Vyssoki et al., 2012; Yip & Yang, 2004), and have used data collected from national registers (Hakko et al., 1998; McDowall et al., 2012; Morken & Linaker, 2000a; Räsänen et al., 2002; Simkin et al., 2003; Tiihonen et al., 1997). There is evidence of two peaks in violent crimes; in May and June (Morken & Linaker, 2000a), and in July and August (McDowall et al., 2012; Sisti, Rocchi, Macciò, & Preti, 2012;

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Tiihonen et al., 1997), but also in December and January (Sisti et al., 2012). There is also a reported downturn in violent crimes from January (Tiihonen et al., 1997) to February (McDowall et al., 2012; Tiihonen et al., 1997) and March (Morken & Linaker, 2000a). The seasonality of homicides has been found to differ from the seasonal variation in assaults in some studies. Rock, Judd, and Hallmayer (2008) suggest that this seasonal asymmetry in homicides and assaults might have been caused by the fact that only a small number of violent crimes result in the death of the victim; additionally, the victim's physical traits have played a part in whether or not an assault has resulted in death. This might explain why seasonality has not been linked to homicides in some reports (Rock et al., 2008). No seasonal variation has been detected in violence victim surveys using data from police registers. Seasonal patterns vary across age groups, locations and type of violence (Carbone-Lopez & Lauritsen, 2013). As with criminals' violent behaviour, there is a peak in suicides in spring and early summer. A second peak occurring in autumn has been observed in some studies (Christodoulou et al., 2012). In addition, the method of suicide is an important factor for seasonal variation. Seasonality has been particularly observed in violent suicides, which have been defined as those using methods other than poisoning (traffic, shooting, hanging, jumping, drowning) (Christodoulou et al., 2009; Jia & Zhang, 2011; Räsänen et al., 2002). It is also possible that the seasonality of suicides is diminishing (Ajdacic-Gross, Bopp, Ring, Gutzwiller, & Rossle, 2010; Simkin et al., 2003; Yip & Yang, 2004).

There are only few studies available on the seasonal variation of hospital violence and the use of seclusion and restraint in psychiatric hospitals. The results of studies on the seasonal variation of hospital violence have been somewhat conflicting (Bowers et al., 2011). Statistically significant peaks in hospital violence have been reported to occur from January to April (Peluola, Mela, & Adelugba, 2013), in the summer months (Morken & Linaker, 2000b; Weizmann-Henelius & Suutala, 2000), but also in the autumn (Bowers et al., 2011; Morken & Linaker, 2000b). In a Finnish study, there were fewer hospital violence incidents in the autumn than during other seasons (Weizmann-Henelius & Suutala, 2000). In a study by the Massachusetts Department of Mental Health on assaults committed by patients, there was an interesting difference between inpatient and outpatient violence. In inpatient units, assaults were more likely to occur in the summer months, whereas in community units, they were more prone to happen in winter (Flannery, Flannery, & Walker, 2010). Similarly, seasonal variation in seclusion was found in a previous study conducted in Finland. Seclusion incidents and the sum of total seclusion days were the highest between July and November. The total number of seclusion days was lowest in January. The results were statistically significant (Paavola & Tiihonen, 2010).

There is seldom a single explanation for inpatient violence. Three different frameworks have been recognised for the causes of violence, including internal, external and situational factors. In addition to patients' internal and external characteristics, the frameworks take into account interaction between staff and patients, the organisation of treatment, the possibility to have privacy in the unit, and temporary presence of less experienced and permanent staff etc. (Duxbury, 2002). Explanations for the seasonal variation of violent behaviour in a community include, for example, bio-psychiatric factors, such as the relationship between weather variables (temperature changes from cold to warm during spring), monthly changes of day length (Morken & Linaker, 2000b; Praschak-Rieder, Willeit, Wilson, Houle, & Meyer, 2008) and neuroendocrine cycles, especially in the serotonergic system and in cholesterol variables (Ajdacic-Gross et al., 2010; Praschak-Rieder et al., 2008; Preti & Miotto, 2000; Repo-Tiihonen, Paavola, Halonen, & Tiihonen, 2002). Sociologists and criminologists have used the temperature aggression theory in explaining the seasonal variance of crimes (Hipp, Bauer, Curran, & Bollen, 2004). This theory bears similarities with the bio-psychiatric approach, but also includes a simple causal mechanism which entails uncomfortably hot weather increasing people's frustration and leading to aggressive behaviour. In recent

years, a theory has been proposed on a mechanism linking temperature to aggression in suicides. In this theory, it is suggested that brown adipose tissue activation and its connection to triggering anxiety and negative effects on mood could explain the suicide occurrence in late spring and early summer (Holopainen, Helama, Björkenstam, & Partonen, 2013; Holopainen, Helama, & Partonen, 2014). Further factors, such as the amount of a person's social contacts or the quality of their social relationships, have been suggested to explain the seasonal variation of suicidal behaviour or violent victimisation (Ajdacic-Gross et al., 2010; Carbone-Lopez & Lauritsen, 2013). Sociologists have also explained seasonal variation with a theory on routine activities. This theory includes a view that, in order for an act of violence to transpire, there is a need for three elements to occur at the same time and space: an offender, a suitable target and an absence of guardians (Hipp et al., 2004). McDowall et al. (2012) have pointed out that there is conflicting empirical support for the theories on temperature aggression and routine activities, partly because they are considerably flexible (McDowall et al., 2012). From the perspective of inpatient violence, theories must be regarded with caution when they have been based on crimes or suicides committed in a community (Steinert, 2002).

Based on a previous study conducted in the same hospital as the present one, seasonal fluctuation has been found in the seclusion and restraint of patients (Paavola & Tiihonen, 2010), but there is no clarity on the seasonal variation of inpatient violence. It is interesting to find out if there is similar seasonal variance in inpatient violence and in seclusion and restraint as has been indicated in violent criminal behaviour and suicides. Some particular factors may play a role in an organisation during the calendar year which could explain violent behaviour. Awareness of these issues could promote the development of practises, which in turn could enhance the safety of patients and staff. The aim of this study was thus to investigate whether there is seasonal variation in violence and the use of seclusion and restraint in a forensic psychiatric hospital.

## 2. Methods

### 2.1. Forensic psychiatric services in Finland

In Finland, there are two state-run forensic psychiatric hospitals. Several national laws are concerned with forensic psychiatric services in the country. Provisions on criminal responsibility are stipulated in the Criminal Code of Finland. The principles of organising health care - including psychiatric care - are determined in the Health Care Act, while those specifically concerned with psychiatric health care are specified in the *Mental Health Act (1990)*. The Ministry of Social Affairs and Health is responsible for the organisation of the national health care system. At the regional level, municipalities have this duty.

Municipalities are also responsible for the provision of psychiatric care in all local social and health care organisations. The *Mental Health Act* also gives provisions on the operations of state mental hospitals. Municipalities act, in fact, as customers of the state mental hospitals, because they must buy forensic psychiatric treatment services from the hospitals. According to the *Mental Health Act*, the tasks of the state mental hospitals include performing forensic mental examinations on a court order, providing forensic psychiatric treatment for those patients who have been found not guilty by reason of insanity and also hospitalising patients who have been deemed too dangerous and difficult to treat in municipal hospitals.

According to the *Criminal Code (2003)*, the person accused might be not responsible for his/her criminal offence due to a mental illness, a serious mental disorder or a serious disturbance of consciousness. Diminished responsibility for a criminal offence may be based on similar but milder findings. The court decides if a forensic mental examination is needed. Finally, the court independently decides on the person's criminal responsibility regardless of the forensic psychiatric findings. Offenders who have been found fully responsible and those with

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