



ILKKA OJANSUU, JARI TIIHONEN, MARKKU LÄHTEENVUO

DEATHS BY SUICIDE DURING INPATIENT TREATMENT AMONG FINNISH FORENSIC PSYCHIATRIC PATIENTS

ABSTRACT

This study examined deaths by suicide during inpatient forensic psychiatric treatment in Finland between 1980 and 2009. The cohort included 1,253 patients (153 women, 1,100 men) assigned to involuntary treatment after being deemed criminally irresponsible due to mental illness. The patients were followed until the end of 2011, during which 351 deaths occurred, including 31 suicides. Suicides occurred on average 3.3 years after treatment initiation, with a mean age of 37.2 years at death. Hanging was the most common method (64.5%), followed by drug overdose, drowning and jumping from a height. Suicide risk persisted throughout the entire course of treatment, from as early as one month to more than 14 years after admission. The analyses revealed that 32.3% of those who died by suicide had committed a violent offense against a family member (e.g. parent, child or spouse), compared to 17.7% of those who did not, a statistically significant difference ($p=0.037$). Additionally, substance use disorder (SUD) was significantly less common among patients committing suicide (41.9%) than among non-suicide patients (60.5%), a difference that was statistically significant ($p=0.042$). These findings suggest that suicide during forensic psychiatric care may be associated with a history of serious intrafamilial violence and that it may occur independently of comorbid substance use. The persistence of suicide risk over extended treatment periods highlights the importance of continuous risk assessment and individualized support strategies throughout the course of forensic psychiatric hospitalization.

KEYWORDS: FORENSIC PSYCHIATRY, SUICIDE, INPATIENT TREATMENT, SCHIZOPHRENIA

INTRODUCTION

Mental disorders are known to be associated with an increased risk of suicide (1). Due to differences in study designs and follow-up periods, results have varied, but a broad meta-analysis concluded a standardized mortality ratio (SMR) of 12.9 for suicide mortality in schizophrenia (2).

Among schizophrenia patients, suicide mortality tends to be higher in younger age groups and early stages of the illness (3,4). In a Finnish dataset, the highest risk was among those aged 15–29 (5). Other associated risk factors include male gender, high education and intelligence before illness onset, depression, previous suicide attempts and substance abuse as well as disorder-related agitation and restlessness, active hallucinations and delusions, impulsive behaviour, fear of mental disintegration, poor treatment compliance, repeated

short hospitalizations and hopelessness, as well as social factors such as being single and living alone (3,6,7).

The greatest risk of suicide for schizophrenia patients is considered to be during psychiatric care and in the first few weeks following discharge, though the risk remains elevated for at least a year post-discharge. This elevated risk is thought to be related to symptom alleviation and increased awareness of one's condition. (8,9,10)

Psychiatric research often focuses on specific diagnostic groups or treatment types. For forensic psychiatric patients, however, cross-country comparisons are more complicated (11). In Finland, forensic psychiatric patients must have a diagnosed serious mental disorder, in practice psychosis and most often schizophrenia spectrum, unlike in some other countries where personality disorders, for example, can also warrant forensic psychiatric care. Therefore, comparing mortality

data internationally is problematic due to differences in legal systems, which may lead to differences in treatment practices and definitions of forensic patients.

In a British study comprising 595 forensic psychiatric patients, the standardized mortality ratio (SMR) for those treated due to a mental disorder was 6.3, while the SMR for those who died by suicide was 35.5 (12). In a Japanese study involving 785 forensic psychiatric patients receiving treatment for psychotic disorders, the overall SMR was 2.6, and the SMR for suicide mortality was 17.7 (13). In another British dataset of 5,955 forensic psychiatric patients, 54.1% were diagnosed with a mental illness (the rest had psychopathic disorder or mental impairment) (14). Among those 3,205 with mental illness, 78 patients died by suicide during treatment and 140 after treatment had ended. The SMR for suicides occurring during treatment was 40.1 for women and 6.6 for men. For suicides that occurred after discharge, the SMR was 44.9 for women and 23.3 for men.

Among Finnish forensic psychiatric patients, overall mortality has been found to be three times higher than that of the general population (15). While most deaths were associated with somatic illnesses, the largest discrepancy in mortality compared to the general population was observed in suicide mortality, which was more than sevenfold (SMR 7.1) (16).

To effectively reduce deaths by suicide, it is essential to gain further insight into the subset of patients who die by suicide during inpatient treatment.

MATERIALS AND METHODS

The sample consisted of 1,253 patients assigned to forensic psychiatric treatment in Finland from 1980 to 2009. Their mental state was assessed by the Finnish Institute for Health and Welfare (THL) based on court orders. These patients were deemed criminally irresponsible due to mental illness and were committed into involuntary treatment instead of imprisonment. Data were collected from THL's forensic psychiatric board records. The patients were followed until the end of 2011 through two national registers (National Cause of Death Register of Statistics Finland and the National Institute for Health and Welfare's Forensic Psychiatric archive). During this time, 351 patients died, and the cause of death was obtained from Statistics Finland for all deceased.

Chi-Squared Test was used to evaluate statistical difference in substance use and having the index criminal act committed against a family member between the total cohort and those who committed suicide during treatment. These variables were chosen

due to being available from the dataset and being clinically relevant. No other variables were tested. P-values were not corrected for multiple comparisons and a p-value below 0.05 was considered statistically significant.

The SMR was calculated as the ratio of deaths observed in the data and deaths expected based on the mortality data for the general population and using the person-year method, 95% confidence interval and Poisson distribution.

This study was purely registry based and involved no direct contact with subjects. Approval was granted by THL and Statistics Finland.

RESULTS

The study consisted of 1,253 patients committed to forensic care, of whom 153 (12.2%) were women and 1,100 (87.8%) were men. All patients included in the data had a psychotic disorder, mostly (87%) on the schizophrenia spectrum (ICD-10: F20-29). More specifically 60% had schizophrenia (ICD-10: F20.x), 13% had delusional disorder (F22.x), 9% had schizoaffective disorder (F25.x), and the rest other psychiatric disorders affecting reality testing.

Of the patients, 31 committed suicide while in forensic psychiatric treatment. This resulted in an SMR of 7.39 (95% CI 5.2–10.5) (This figure has been previously published in a thesis)¹⁷. Of those 31 who committed suicide, 4 (12.9%) were women and 27 (87.1%) were men, 30 (96.8%) had a diagnosis of schizophrenia spectrum, more specifically 18 (58.1%) had a diagnosis of schizophrenia, 6 (19.4%) delusional disorder and 2 (6.5%) schizoaffective disorder. The only one who committed suicide without a schizophrenia spectrum disorder had been diagnosed with dementia. The average time from the beginning of treatment to suicide was 3.3 years (median 2.1 years, range 0.1–14.2 years). The average age at time of suicide was 37.2 years (median 33.2, range 19.8–71.1 years).

The most common method of suicide was hanging, which accounted for 20 (64.5%) of the suicides. Of those who hanged themselves, 18 (90%) were men and 2 (10%) were women. Hanging had been carried out on average 3.0 years from the beginning of treatment (median 2.2 years, range 0.1–12.3 years).

The second most common method of suicide was drug overdose, which accounted for 4 (12.9%) of the suicides. All of these who committed suicide were men, and the suicide had been carried out on average 2.9 years from the beginning of treatment (median 2.9, range 1.2–4.8 years).

The third most common method of suicide was drowning, which accounted for 3 (9.7%) of the suicides. All of these who

committed suicide by drowning were men, and the suicide had been carried out on average 5.8 years from the beginning of treatment (median 2.6 years, range 0.6–14.2 years).

The fourth most common method of suicide was jumping from a height, which accounted for 2 (6.5%) of the suicides. One of these patients was a woman and the other a man. These suicides had been carried out on average 1.0 year from the beginning of treatment (median 1.0, range 0.9–1.1).

The number and temporal occurrence of suicides, divided by suicide category and gender, is presented in *Table 1*.

Out of the total sample of 1,253 patients, 753 had committed a homicide, attempted homicide or aggravated assault. Of these, 226 were directed at a family member (spouse, mother, father or own child), meaning that 18.1% of the total patient sample had targeted a family member. Among those 31 who died by suicide, 22 had committed similarly serious violent crimes, and of these, 10 (32.3%) were directed at family members, indicating a statistically significant difference between the groups ($\chi^2=4.35$, $p=.037$). Of the total sample, 752 (60%) had

a substance use disorder, while only 13 of the 31 (42%) who committed suicide had one, indicating a statistically significant difference between the groups ($\chi^2=4.33$, $p=.037$). A statistical comparison using the Chi-Squared Test for these variables is presented in *Table 2*.

DISCUSSION

Deaths by suicide during forensic psychiatric care were alarmingly common and the suicide mortality among Finnish forensic psychiatric inpatients was seven times higher during care than in the general population, indicating a clear failure in care. Although 87% of those who died by suicide were men, this aligns with the gender distribution of the forensic psychiatric population, indicating that there are no clear gender differences.

The timing of suicides varied widely, from 1 month to over 14 years, averaging 3.3 years, showing that suicide risk exists throughout the treatment period and requires vigilance and risk assessment from the staff throughout treatment. The

Table 1. Characteristics of suicides during treatment.

	N	Time from start of treatment, mean (years)	Age at death (range)
Suicides, all	31	3.3	37.2 (19.8-71.1)
Male	27	3.2 (0.1-14.7)	38.7 (21.0-71.1)
Female	4	4.0 (0.2-9.7)	27.7 (19.8-33.2)
Suicide by hanging, all	20	3.0 (0.1-12.3)	39.9 (25.0-71.1)
Male	18	3.1 (0.1-12.3)	41.2 (25.0-71.7)
Female	2	2.7 (0.16-5.3)	29.0 (26.1-31.9)
Suicide by drug overdose, all	4	2.9 (1.2-4.8)	29.5 (21.5-38.7)
Male	4	2.9 (1.2-4.8)	29.5 (21.5-38.7)
Female	-	-	-
Suicide by drowning, all	3	5.8 (0.6-14.2)	36.7 (35.5-38.0)
Male	3	5.8 (0.6-14.2)	36.7 (35.5-38.0)
Female	-	0 (0)	0 (0)
Suicide by jumping from a height, all	2	1.0 (0.9-1.1)	20.4 (19.8-21.0)
Male	1	1.1 (1.1)	21.0 (21.0)
Female	1	0.9 (0.9)	19.8 (19.8)



	N	Time from start of treatment, mean (years)	Age at death (range)
Suicide by other means, all	2	5.2 (0.7-9.7)	43.5 (33.2-53.8)
Male	1	0.7 (0.7)	53.8 (53.8)
Female	1	9.7 (9.7)	33.2 (33.2)

Table 2: Statistical Comparison Between Suicide and Non-Suicide Patients using Chi-Squared Test.

Variable	Suicide Group (n = 31)	Non-Suicide Group (n = 1222)	p-value
Family-Targeted Violence	10 (32.3%)	216 (17.7%)	0.037
Substance Use Disorder	13 (41.9%)	739 (60.5%)	0.037

ages of patients committing suicide ranged from 19 to 71 years. While suicides were more common among younger individuals (median 33 years), older patients were also at risk.

Hanging was the predominant method (64.5%), likely due to limited means in closed environments. Other methods were less common, with drug overdoses and drownings averaging longer treatment durations before occurring.

Interestingly, those individuals who had committed a violent crime against their family members were more likely to commit suicide during treatment. This may be due to aggravated guilt or remorse after realization of the criminal act. Also interestingly, those patients without a substance use disorder were more likely to commit suicide during inpatient treatment. Not having a substance use disorder may be an indication of a lesser degree of antisociality and thus a better ability for empathy and guilt, which may increase risk for suicide. Other risk factors for these patients likely also include the realization of their condition, as has been reported for the general base of patients with schizophrenia. Although our results stem from a single sample and should thus be considered exploratory and reflect only associations, not necessarily causative factors, these risk factors should be taken into consideration when assessing risk for suicidal behaviour during forensic psychiatric treatment.

Beyond recognizing risk factors, it's crucial to foster protective elements: safe ward environments, visibility and supervision, staff collaboration and suicide risk awareness (18). In addition to repeated suicide risk evaluation, reductions

in treatment intensity should be gradual, ensuring meaningful daily activity (6,19).

Though the sevenfold risk is unacceptable, it is still lower than in other countries: British studies have reports over 35 times and Japanese over 17 times the general population's suicide mortality among forensic patients with schizophrenia (12,13).

Finnish forensic psychiatric patients' suicide mortality is comparable to that of general Finnish patients with schizophrenia (6.6 times higher) (20), but since most suicides in schizophrenia occur outside hospitals (10), the in-hospital sevenfold rate previously reported from this sample is particularly alarming. This may be due to longer treatment durations and the gravity of offences involved.

CONCLUSION

Deaths by suicide among forensic psychiatric inpatients are alarmingly high throughout treatment, affecting both young and older patients. Interestingly, those who had committed violence against family members, as well as those without a substance use disorder, were more likely to commit suicide during inpatient treatment. These findings underscore the need to enhance risk assessment and provide a safe treatment environment to prevent such outcomes.

Authors

Ilkka Ojansuu¹

Jari Tiihonen^{1,2,3,4}

Markku Lähteenvuo^{1,2,3,4}

¹Department of Forensic Psychiatry, University of Eastern Finland, Niuvanniemi Hospital, Kuopio, Finland

²Department of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden

³Center for Psychiatry Research, Stockholm City Council, Stockholm, Sweden

⁴Neuroscience Center, University of Helsinki, Helsinki, Finland

Correspondence

Docent Markku Lähteenvuo

E-mail: markku.lahteenvuo@uef.fi

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