



## Non-psychiatric inpatient care preceding admission for self-harm in young people



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### ABSTRACT

**Objective:** Many young people contact health services before they harm themselves intentionally. However, they often seek care for non-suicidal or non-psychiatric causes despite having suicidal thoughts. We investigated the non-psychiatric hospital diagnoses received by young people during the year before their first admission to hospital for self-harm.

**Methods:** From a national register, we selected people who were hospitalised for an episode of self-harm during the period 1999–2009, at which time they were aged 16 to 24. We compared them with matched controls regarding the probability for having been admitted with different diagnoses during the year preceding the self-harm admission.

**Results:** The study included 48,705 young people (16,235 cases and 32,470 controls). Those admitted for self-harm were more likely than controls to have been hospitalised for non-psychiatric reasons, which included symptomatic diagnoses such as abdominal pain, syncope/collapse, unspecified convulsions, and chest pain. Certain chronic somatic illnesses were also overrepresented, such as epilepsy, diabetes mellitus type 1, and asthma. **Conclusion:** Symptomatic diagnoses were more common in those who had been admitted for self-harm. It is possible that psychiatric problems could have been the cause of the symptoms in some of these admissions where no underlying illness could be found, and if this was not uncovered it might lead to a delay in suicide risk assessment. For several chronic illnesses, when admitted to hospital, a psychiatric evaluation might be indicated.

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## 1. Introduction

Self-harm is a major and growing public health problem worldwide [1], especially among young people [2–4]. Young people are here defined as persons in the age 15–24 years, corresponding to the WHO-definition of youth [5]. The term self-harm, either by self-poisoning or self-injury, includes both suicide attempts and self-harm without suicidal intent [6]. Lifetime prevalence of self-harm among young people is reported to be between 9% and 26% (17% reported in Sweden [7]), with past year prevalence rates of between 3% and 8% [8]. In most parts of the world, self-harm is more common among adult women while suicide is more common among men [9]. This pattern is also seen among young people, where young women more often self-harm [8,10], while suicide is more common among young men [11]. In both men and women, hospital admissions due to self-harm are most common in the 15–24 age group [12], and rates are continuously increasing [13]. Self-harm is the clearest single risk factor for subsequent

suicide [14]. This is particularly important given that suicide rates for young people have not declined in Sweden as they have in other age groups [12].

Most people who harm themselves intentionally have been in contact with health services prior to the self-harm act [15]. However, young people often seek care for non-suicidal or non-psychiatric causes, despite having suicidal thoughts [16]. One study reported that when young people contacted primary care during the years before they killed themselves, only 20 out of 36 sought help for psychiatric problems [17].

It is well known that various physical illnesses leads to an increased risk of suicide attempts [18,19]. However, studies are lacking that investigate the full range of non-psychiatric diagnoses that could manifest before an episode of self-harm. In particular, larger studies with a control group are lacking. One Danish register study reported that young people who had been in contact with medical services had a higher risk for a subsequent suicide attempt [20]. However, this study only investigated a subset of predetermined diagnoses.

In Sweden, we have favourable conditions to conduct large-scale studies using inpatient care registers that include longitudinal data on self-harm and diagnoses from previous admissions.

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### 1.1. Aim

In this study, we aim to investigate the extent to which young people received inpatient care during the year before their first hospital admission for self-harm. We hypothesised that individuals admitted for self-harm more often were admitted for non-psychiatric reasons than a control group.

## 2. Method

We used a nested case-control design, using data drawn from the Swedish national inpatient register [21]. We used this register because it is the most reliable source of healthcare contacts, as registered outpatient visits has shown a higher degree of missing main diagnoses [22].

### 2.1. Subjects and procedure

Cases were people who were hospitalised for an episode of self-harm, with ICD diagnosis codes X60–X84 (Intentional self-harm), during the period 1999–2009, at which time they were aged 16 to 24. This age group was chosen as it is a critical period during which young people are transitioning between childhood and adulthood. Furthermore, 16 is the most common age for first onset of self-harm [23]. To investigate contacts with healthcare prior to first admission for self-harm, we excluded those previously hospitalised for intentional self-harm from 1987 up to the start of the study in 1999. We also excluded those who were under 16 when first hospitalised for self-harm during the study period.

We randomly selected two controls for each case, matched for sex, age, and home municipality, from the total population register. Controls ranged in age from 15 to 25 at inclusion (instead of 16 to 24), as matching was based on year of birth and not exact birth date. We collected all inpatient ICD-10 [24] diagnoses of selected cases and controls for the year preceding the cases' first hospitalisation for self-harm. Diagnoses were set at discharge from hospital. We limited the period of observation to 1 year to investigate temporal links between self-harm and preceding admissions.

The study included 48,705 subjects (16,235 cases and 32,470 controls). About two thirds (68.5%) were female. Age at inclusion (date at which cases were admitted for self-harm) ranged from 15 to 25, with

a mean of 19.6 years (15–18 years: 37.8%; 19–21 years: 35.2%; and 22–25 years: 27.0%). Women were younger (mean age: 19.4 years; 15–18 years: 41.6%; 19–21 years: 34.6%; and 22–25 years: 23.7%) than men (mean age: 20.1 years; 15–18 years: 29.4%; 19–21 years: 36.5%; and 22–25 years: 34.1%),  $t$ -test  $p < 0.001$ .

### 2.2. Statistical analyses

Differences in age between men and women, and differences in number of admissions between cases and controls, were calculated using independent-samples  $t$ -test. Cases and controls, and men and women, were compared regarding the proportion that had been admitted by calculating odds ratios. Chi-square test was used to test the significance of the proportion admitted in different age groups. Analyses were conducted using SPSS version 23.

The study was approved by the Regional Ethical Review Board in Umeå, Sweden, Dnr 2010-407-31M.

## 3. Results

We analysed admissions from the year *prior* to the cases' first self-harm admission. Cases had no previous self-harm admissions, because of the selection process. Controls had 20 self-harm admissions during the year studied (10 individuals among all 32,470 controls).

The number of hospitalisations ranged from 0–32, where 86% of the subjects had no admissions, 13% had 1–4 admissions, and 1% had 5–32 admissions.

As shown in Table 1, cases were more likely to have been admitted than controls, including when hospitalisations were grouped according to ICD-10 chapters [24].

Chapters I–IV, VI–XIV and XVII were combined as a somatic disorders group, where 6% of cases and 2.1% of controls had such an admission (Odds ratio 2.9, 95% confidence interval 2.6–3.2). Gender-stratified analyses were also conducted, with similar patterns in men and women (Fig. 1).

The only chapter where cases were less likely than controls to have an admission was in chapter XV (*Pregnancy, childbirth and the puerperium*) (OR 0.8, 95% CI 0.6–0.9). The odds ratio was close to 1 (OR 1.1, 95% CI 0.5–2.3) for cases and controls to be admitted with a diagnosis in the combined chapters VII and VIII (*Diseases of the eye*

**Table 1**  
Proportion admitted in each ICD chapter – comparison between cases and controls.

ICD chapter	Diagnostic category	Cases 16,235 N (%)	Controls 32,470 N (%)	OR	95% CI
All admissions	All admissions	5092 (31.4)	1825 (5.6)	7.7	(7.2–8.1)
I–IV, VI–XIV and XVII	Somatic	969 (6.0)	698 (2.1)	2.9	(2.6–3.2)
–	Admissions without a main diagnosis	535 (3.3)	42 (0.1)	26.3	(19.2–36.0)
I	Certain infectious and parasitic diseases	98 (0.6)	61 (0.2)	3.2	(2.3–4.4)
II	Neoplasms	31 (0.2)	25 (0.1)	2.5	(1.5–4.2)
III	Diseases of the blood, blood-forming organs and immune mechanism	13 (0.1)	7 (0.0)	3.7	(1.5–9.3)
IV	Endocrine, nutritional and metabolic diseases	99 (0.6)	43 (0.1)	4.6	(3.2–6.6)
V	Mental and behavioural disorders	3104 (19.1)	170 (0.5)	36.5	(31.3–42.6)
VI	Diseases of the nervous system	83 (0.5)	29 (0.1)	5.7	(3.8–8.8)
VII + VIII	Diseases of the eye and adnexa, diseases of the ear and mastoid process	10 (0.1)	19 (0.1)	1.1	(0.5–2.3)
IX	Diseases of the circulatory system	54 (0.3)	32 (0.1)	3.4	(2.2–5.2)
X	Diseases of the respiratory system	164 (1.0)	148 (0.5)	2.2	(1.8–2.8)
XI	Diseases of the digestive system	195 (1.2)	165 (0.5)	2.4	(1.9–2.9)
XII	Diseases of the skin and subcutaneous tissue	40 (0.2)	21 (0.1)	3.8	(2.3–6.5)
XIII	Diseases of the musculoskeletal system and connective tissue	82 (0.5)	69 (0.2)	2.4	(1.7–3.3)
XIV	Diseases of the genitourinary system	175 (1.1)	76 (0.2)	4.6	(3.5–6.1)
XV	Pregnancy, childbirth and the puerperium	187 (1.2)	496 (1.5)	0.8	(0.6–0.9)
XVII	Congenital malformations, deformations and chromosomal abnormalities	28 (0.2)	31 (0.1)	1.8	(1.1–3.0)
XVIII	Symptoms, signs and abnormal clinical and laboratory findings	650 (4.0)	223 (0.7)	6.0	(5.2–7.0)
XIX	Injury, poisoning and certain other consequences of external causes	863 (5.3)	284 (0.9)	6.4	(5.6–7.3)
XXI	Factors influencing health status and contact with health services	330 (2.0)	63 (0.2)	10.7	(8.1–14.0)

OR: Odds ratio, CI: confidence interval.

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