EFFECTS OF PSYCHIATRIC ADMISSIONS ON SELF-HARM AND SUICIDE IN PEOPLE WITH BORDERLINE PERSONALITY DISORDER

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STUDY PROTOCOL

PURPOSE AND AIMS

Our purpose is to investigate whether long and/or compulsory psychiatric admissions have an effect on healthcare visits due to self-harm or completed suicide in people diagnosed with Borderline personality disorder (BPD).

The specific aim is to compare psychiatric clinics that have provided long and/or compulsory psychiatric admissions more frequently to clinics that have provided these admissions less frequently, with respect to subsequent healthcare visits due to self-harm and completed suicide, also in relation to recent discharge. Furthermore, we aim to investigate the effects of long and/or compulsory psychiatric admission on time to readmission to inpatient care.

HYPOTHESES

When comparing the psychiatric clinics that for individuals diagnosed with BPD have provided the most long and/or compulsory admissions, to the clinics that have provided the least:

1. healthcare visits due to self-harm are more frequent
2. completed suicide is more frequent
3. completed suicide within 30 days from discharge is more frequent
4. time to readmission to inpatient care is shorter
5. the number of days in somatic inpatient care due to self-harm is increased
6. the ratio of men to women is approximately the same across healthcare visits due to self-harm, time to readmission to inpatient care, and number of days in somatic inpatient care due to self-harm
7. the ratio of men to women is larger for completed suicide and completed suicide within 30 days from discharge

INTRODUCTION

First, do no harm, is a fundamental principle for all healthcare. When it comes to people diagnosed with BPD, there is a debate whether acute admission to inpatient care does harm or saves lives (Goodman et al., 2012; Warrender, 2018). BPD is a disorder affecting approximately 0,7-2,7% of the population, though diagnosed about three times more commonly in women as compared to men (American Psychiatric Association, 2013). Frequent acts of self-harm with or without suicidal intent are among the core symptoms and the risk for completed suicide is high (Bohus et al.,2021; Leichsenring et al, 2023). As compared to other psychiatric disorders, BPD is among those associated with the highest risk for suicide, especially among young people (Chesney et al., 2014; Fazel & Runeson, 2020; Runeson & Beskow, 1991).

Due to recurrent suicidality and self-harm, people diagnosed with BPD are frequent users of emergency services (Pasqual et al., 2007). Despite this, there is a striking lack of evidence

based guidelines on how to manage suicidality in the emergency department in people diagnosed with BPD (Prosser et al., 2023). The discordance in opinions on the benefits of acute admissions can be demonstrated by the fact that although inpatient crisis intervention is recommended to be kept as short as possible for people diagnosed with BPD, and only based on life threatening behavior (NICE, 2009), BPD has a prevalence of 22,4% in adult psychiatric inpatient units (Bender et al., 2011; Bohus et al.,2021).

Thus, despite little to no evidence that admission to inpatient care, especially with restrictions or force, actually prevents suicide in people diagnosed with BPD (NICE, 2009; Borshmann et al., 2012; James et al., 2012; Huber et al., 2016; Monk-Cunliffe et al., 2022; Paris et al., 2019), acts of self-harm and suicidality are often managed through acute admission (Dasgupta, 2004; Ellison et al., 2018). This conflict is further elucidated in the clinical experiences that on the one hand, too rapid admission to hospital might hamper the development of autonomy by preventing the person with self-harming behavior from developing the skills necessary to manage crises for themselves, possibly escalating the self-harming behavior and subsequently increasing the long-term risk for suicide (Bohus et al., 2021; Coyle et al. 2018, Warrender, 2018). On the other hand, refusal to admit the person to hospital might be experienced as rejection, triggering aggravated self-harm, and thus increasing the risk for suicide in the short-term (NICE, 2009).

There are relatively few studies investigating the possible gains of inpatient care and some of these show beneficial outcomes. However, the interventions in these studies are not crisis responses to imminent suicidality but rather long-term inpatient psychotherapy (e.g. Bartak et al., 2011, Bateman et al., 1999, Fowler et al.,2018). The structure of these admissions for psychotherapy, tailored to treat specific symptoms, is not representative for acute admissions, where individuals with imminent suicidality seek help at a psychiatric emergency department and get admitted to hospital with the purpose of having a safe place to stay.

To fully evaluate the benefits and iatrogenic effects of acute admissions to hospital as a response to a suicidal crisis through an RCT will be ethically complicated, since hospital admission traditionally has been considered life-saving (Black et al., 2004) and may be beneficial for people with comorbid disorders (Miller & Black, 2020). Randomization to non-admission would therefore not only be complicated to motivate ethically, but also difficult to pursue if the suicidal crisis escalates and is likely to make plausible participants decline consent to participate. An innovative approach is a register-based study. The Swedish national registers, such as the National Patient Register, provide a unique opportunity to study near complete populations, removing the risk of selection bias. Hence, this type of study design should constitute the next-best thing to an RCT in terms of study quality. In addition, studies comparing outcomes for individuals diagnosed with BPD depending on exposure to long-term inpatient care and/or compulsory care will always be faced with criticism. Critics will argue that those who are subjected to compulsory care and/or remain in hospital for long periods of time are those patients that are the most severely ill, making it impossible to draw conclusions regarding causality. A study comparing clinics rather than individuals should reduce this problem.

The basis for such a study would be the large differences in clinical practice between clinics, as well as over time (see table 1), in regards to acute admissions of individuals diagnosed

with BPD, including differences in the amount of compulsory care provided (National Board of Health and Welfare, 2023a). Dividing clinics based on their yearly likelihood to admit a person diagnosed with BPD to hospital for longer periods of time or with compulsory care, assuming that people diagnosed with BPD have similar symptoms and prognosis when corrected for sociodemographic factors and access to treatment, would enable us to study the effects of acute hospital admission on time to subsequent admission, visits to healthcare due to self-harm and completed suicide.

PRELIMINARY DATA

Preliminary data show large variations between and within regions over time concerning care for people with personality disorders (F60), as well as compulsory psychiatric care for all diagnoses and admission due to self-harm (see table 1). Since averages are presented for every region, the variation between clinics is expected to be even larger.

TABLE 1. PRELIMINARY DATA. OUTCOMES CALCUALTED PER CALENDAR YEAR AND REGION

OUTCOME	MEAN	MEDIAN	TERTILES	RANGE	SD	SOURCE
No. diagnosed with ICD-10 F60/ 100 000 inhabitants	99	96	90, 107	28-175	25	a
Average* no. days in inpatient care/ individual, for individuals with ICD-10 F60	15	12	9, 16	1-63	10	a
Average* no. of people admitted to compulsory psychiatric inpatient care (any diagnosis) /100 000 inhabitants	110	107	98, 119	30-180	29	b
Average* no. admissions due to self-harm /100 000 inhabitants	109	102	91, 115	47-232	37	c
Average* no. people admitted to inpatient or specialized outpatient care due to self-harm /100 000 inhabitants	77	74	67, 83	38-142	21	c
Average* number of suicides /100 000 inhabitants	13	13	12, 14	6-26	2,8	c

F60 – Personality disorders

a. National Board of Health and Welfare, 2023a, measured 2010-2022
b. National Board of Health and Welfare, 2023b, measured 2011-2021
c. National Board of Health and Welfare, 2023c, measured 2010-2022

*Average per region

PROJECT DESCRIPTION

METHODS:

PARTICIPANTS:

Data for all psychiatric clinics in Sweden that have permission to provide compulsory care for adults will be collected (n=78, e-mail contact with The Health and Social Care Inspectorate 2023-11-13). A specific calendar year for a clinic will be used as one participant, and named after the clinic and the year e.g. Umeå2010, Linköping2013, Malmö2022. These participants will then be ranked based on a composite variable consisting of the mean number days with admissions for compulsory care and other psychiatric inpatient care >5 days for individuals diagnosed with BPD, highest through lowest, during the years 2010, 2013, 2016, 2019 and 2022 (n=78 clinics x 5 calendar years = 390 participants). The participants in the highest quartile (n=98) will be compared to those in the lowest (n=98).

The use of >5 days has previously been suggested as cutoff for long admissions (Lundahl et al., 2018) and is also supported by the fact that the intervention Brief Admission (BA), which allows individuals with suicidal ideation and self-harming behavior to admit themselves into hospital, is generally restricted to 3-5 days (Helleman et al., 2014, Strand et al., 2015, Westling et al., 2019).

The specific calendar years were selected given that data from the compulsory care register is available from 2010 at the earliest. We expect that some clinics will have reduced their long and/or compulsory care admissions for individuals diagnosed with BPD, in line with recent guidelines, over the past decade. We selected to use calendar years at a 3 year interval with two purposes; to better show changes in the use of compulsory care and/or long admissions of the various clinics over the years and to try to avoid dependence with respect to individual clinics and time.

DATA COLLECTION

- Data will be compiled on a calendar year basis (XX 01 01 – XX -12 31) for 2010, 2013, 2016, 2019 and 2022.
- Data will be collected from the National Patient Register (NPR), which has been validated for the personality disorder diagnoses and BPD in women (Kouppis & Ekselius, 2019), the Swedish cause of death register (which is considered to be a reliable source of data; Brooke et al., 2017), *The total population register* and the Swedish Longitudinal Integrated Database for Health Insurance and Labour Market Studies *(LISA).*

RETRIEVED VARIABLES

- Number of people, age ≥18 years, diagnosed with BPD (ICD-10: F60.3)
- Number of days with compulsory admission, including dates and diagnoses, for people diagnosed with BPD, age ≥18 years

- Number of days with voluntary psychiatric admissionso >5 days, including dates and diagnoses, for people diagnosed with BPD, age ≥18 years
- Number of compulsory admissions for people diagnosed with BPD, age≥18 years
- Number of voluntary psychiatric admissions >5 days for people diagnosed with BPD, age≥18 years
- Number days with admission due to self-harm (X60-X84; Intentional self-harm), including dates and diagnoses, for people diagnosed with BPD
- Number of healthcare visits due to self-harm (X60-X84; Intentional self-harm) for people diagnosed with BPD
- Number of deaths by suicide (X60-X84; Intentional self-harm or Y10-34; Events of undetermined intent) in individuals diagnosed with BPD
- Number of deaths by suicide (X60-X84; Intentional self-harm or Y10-34; Events of undetermined intent) within 30 days from discharge, in individuals diagnosed with BPD
- Information on legal gender is collected for all of the variables above

COMPOSITE VARIABLES

- Total number of days with compulsory admission + total number of days with voluntary psychiatric admissions >5 days for people diagnosed with BPD/ total number of people diagnosed with BPD at the specific clinic and calendar year (*Mean compulsory/long-term admission duration; MCLTAD)*
- Total number of compulsory admissions for people diagnosed with BPD/ total number of people diagnosed with BPD at the specific clinic and calendar year *(Compulsory admission frequency; CAF*)
- Total number of psychiatric admissions >5 days for people diagnosed with BPD/total number of people diagnosed with BPD at the specific clinic and calendar year (*Long-term admission frequency; LTAF*)

PRIMARY OUTCOME MEASURES:

- Number of healthcare visits due to self-harm in specialized inpatient or outpatient care, as defined in the NPR (X60-X84; Intentional self-harm) divided by the number of individuals diagnosed with BPD per clinic and calendar year.

- Number of deaths by suicide (X60-X84; Intentional self-harm or Y10-34; Events of undetermined intent) in individuals diagnosed with BPD divided by the number of individuals diagnosed with BPD per clinic and calendar year.

- Number of deaths by suicide (X60-X84; Intentional self-harm or Y10-34; Events of undetermined intent) within 30 days after discharge, in individuals diagnosed with BPD divided by the number of individuals diagnosed with BPD, per clinic and calendar year.

SECONDARY OUTCOME MEASURES

- Number of days between admissions to psychiatric inpatient care for people diagnosed with BPD divided by the number of individuals diagnosed with BPD per clinic and calendar year.

- Number of days between death by suicide (X60-X84; Intentional self-harm or Y10-34; Events of undetermined intent) and discharge in individuals diagnosed with BPD. For this variable, death by suicide during inpatient admission will be labelled 0.

- Number of days in somatic (non-psychiatric) inpatient care after self-harm (X60-X84; Intentional self-harm) divided by the number of individuals diagnosed with BPD per clinic and calendar year.

MOTIVATION FOR OUTCOME MEASURES

Self-harm is relatively common in people diagnosed with BPD and associated with an increased risk of suicide (Bohus et al.2021; Zahl et al., 2004; Carroll et al., 2014). It is often regarded as a key outcome (NICE, 2011; Kapur, 2013).

Completed suicide is probably the most relevant outcome since the purpose of admission to inpatient care for individuals diagnosed with BPD is to prevent suicide. Meanwhile, there is little to no evidence to support that inpatient admission has these effects (Borshmann et al., 2012; NICE, 2009; Monk-Cunliffe et al., 2022; Paris et al., 2019) and it is even thought to increase the risk of suicide in the long term. Moreover, completing suicide is more than twice as common for men as compared to women, in Sweden and globally (World Health Organization, 2022).

Recent discharge from psychiatric admission is a known risk factor for completed suicide and 30 days is a reasonable time frame to consider it recent (Haglund et al., 2019).

As a measure of the severity of self-harm we used number of days in somatic (non-psychiatric) inpatient care after self-harm (X60-X84; Intentional self-harm).

Time to readmission is a relevant outcome since individuals diagnosed with BPD are prevalent in inpatient care even though there is little evidence in regard to the positive effects of inpatient care on the risk of suicide.

For all outcome measures, whole-sample results will be complemented by results disaggregated by gender, as per the Sex and Gender Equity in Research guidelines (Heidari et al., 2019).

COMPARISIONS

- The basis for comparisions will be a composite score based on the total number of days with compulsory admissions and the total number of days with psychiatric admissions >5 days.
- Participants will be divided into quartiles based on this composite score, ranked from high to low.
- Participants in the highest quartile will be compared to those in the lowest.
- If statistically feasible, gender-based analyses will be performed comparing means of women and men between the highest and lowest quartiles.

CONFOUNDERS

- Number of people diagnosed with BPD, age ≥ 18years per clinic

- Number of people diagnosed with BPD/100 000 inhabitants, age ≥ 18years
- Number of psychiatric out-patient visits/100 000 inhabitants for people diagnosed with BPD, age ≥ 18years
- Average yearly income people diagnosed with BPD, age ≥ 18years per clinic
- Number of Dialectic behavioural therapy (DBT, DU021), mentalization based treatment (MBT, DU013) and ERGT(Emotion regulation group therapy, DU015) sessions/100 000 inhabitants, age ≥ 18years
- Concomitant diagnoses in people diagnosed with BPD
- Marital status and education of people diagnosed with BPD
- Number of individuals residing in the uptake area
- Mean age of the population in the uptake area
- Distribution of gender in the uptake area

STATISTICAL ANALYSES AND POWER

Depending on the distribution, participants will be grouped to enable comparisons between participants with high and low admission rates and duration for compulsory and/or ≥5 days inpatient care. If the distribution is even grouping will be made in quartiles. If an uneven distribution cannot justify this procedure, grouping will be made to create reasonably large groups with the goal to detect significant between group differences. Data will also be analyzed as continuous variables.

Since 2015, visits to the emergency department leading to inpatient admission must be reported both as visits to specialized outpatient care and inpatient admission. This will be corrected for when analyzing data.

During data analyses, we will use different regression models (linear, logistic and Cox regressions) depending on the characteristics of the outcome. When we use the Cox regression models, we will be able to take the follow-up time into account. In all analyses, we will be able to adjust for potential confounders (e.g., age, number of diagnoses, income, marital status, educatin, as well as the size of the uptake area and the intensity of outpatient care for the different clinical calendar years as well as if there is for example geographical dependence between participants with the same clinic).

A total of 78 clinics x 5 years = 390 participants (clinical calendar years) will be included. According to the experience of participating researchers (Lars Rylander, professor in epidemiology) this is a large number of participants, deemed to be fully sufficient to answer the research questions. This can be illustrated by the following example. We assume that the 390 participants are treated as independent observations and an outcome is prevalent in 30% in the lowest quartile. We will then with 80% statistical power be able to detect a

significant ($p<0.05$) odds ratio of 1.68 or higher when comparing the highest quartile with the lowest quartile.

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