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READMISSIONS TO ADOLESCENT PSYCHIATRIC INPATIENT CARE: A REGISTER STUDY

ABSTRACT

Objectives: *Readmissions to inpatient care shortly after discharge are considered a problem. In psychiatry, repeated readmissions are referred to as a "revolving door" phenomenon and are assumed to illustrate failure of care. We set out to study readmissions in adolescent psychiatry. The aim of our study was to determine the proportion of patients who are readmitted to the hospital in general during adolescent years, and those who are readmitted within 30 days of discharge. We investigated the association of various sociodemographic, psychosocial, and symptom- and disorder-related factors with readmission.* ***Materials and methods:*** *We conducted a retrospective chart review of all patients admitted to the adolescent psychiatric ward at Tampere University Hospital from 2016 to 2020. We collected data on patient age, gender, family risk factors, diagnoses, symptoms and any new treatment episodes. We cross-tabulated gender, child protection involvement, diagnoses, symptoms and family risk factors with overall readmission, readmission within 30 days of discharge and the number of readmissions. To explore independent associations of the partially overlapping explaining variables, we used multivariable analyses.* ***Results:*** *Nearly half of the patients (48.4%) experienced a readmission during adolescent years. Thirteen per cent of patients were readmitted within 30 days of discharge. In bivariate associations female gender, diagnosis from schizophrenia group, diagnosis from somatoform disorder group and a child welfare contact predicted readmission in general. The only factor increasing readmission within 30 days of discharge was female gender. In the multivariable analyses, female gender, a diagnosis from the schizophrenia disorder group, mood disorder group, anxiety disorder group and somatoform disorder group predicted readmission. Additionally, symptoms of psychosis, self-harm and eating disorders increased the risk of readmission. Conversely, depressive symptoms and concerning alcohol and substance use were found to be protective against readmissions.* ***Conclusions:*** *In our study, the overall readmission rates were significantly higher than in many other studies. However, the 30-day readmission rates were closer to those found in other research. These differences are likely due to variations in patient populations, healthcare systems and treatment practices as well as a longer follow-up time used in the present study. Readmissions were predicted by severe disorders such as schizophrenia group and somatoform group disorders and self-harm. This suggests that illness-related factors play a major role. However, female gender predicted readmissions in general and within 30 days when disorder-related factors were accounted for. Such gender difference may warrant societal attention to gender inequalities.*

KEYWORDS: ADOLESCENT PSYCHIATRY, INPATIENT CARE, READMISSIONS, REVOLVING DOOR

INTRODUCTION

Psychiatric deinstitutionalization is understood as a shift in main focus in psychiatric healthcare from inpatient to outpatient care. In practice this has meant the closure of psychiatric hospitals or reduction of hospital beds in addition to establishing alternative services in the community (1). In Finland psychiatric deinstitutionalization is thought to have begun in 1980s and since then the main focus of psychiatric treatment has moved towards outpatient care. For instance, in 1990s the number of psychiatric hospital beds decreased by 50 per cent (2). Similar trends have continued in the 2000s and 2010s as well (3–5).

Despite strong efforts towards deinstitutionalization in the psychiatric field, inpatient treatment has not decreased in adolescent psychiatry. The number of inpatient treatment episodes and patients treated in adolescent psychiatry in Finland increased significantly from the mid-1990s until 2010, despite a substantial increase in outpatient services (6). The growth in the use of inpatient treatment has continued into the 2010s. According to database reports from the Finnish Institute for Health and Welfare, the number of children and adolescents receiving psychiatric inpatient care relative to the population has increased by twenty per cent between 2012 and 2021(7). There are many possible reasons for the increased use of inpatient treatment. Awareness of psychiatric disorders has increased, potentially leading to previously unnoticed treatment needs becoming recognized demands. Additionally, reinterpretations may play a role: problems in youth might now be more readily interpreted as mental health issues compared to earlier perceptions. The decline in preventive services and the impact of medicalization have also been considered potential reasons for the growth in inpatient treatment (6).

Efforts have been made towards deinstitutionalization, as outpatient care has been considered a more therapeutic, humane and cost-effective alternative to hospitalization. However, deinstitutionalization has also led to the emergence of new challenges. Outpatient services have not universally grown proportionately or as rapidly as hospitalization has been reduced (8). Additionally, when inpatient treatment episodes are shortened, some discharged patients end up returning to the hospital shortly thereafter. According to studies, approximately one fourth to even half of discharged young individuals are readmitted within a year of their initial admission (9–11) or even more quickly. The phenomenon of recurrent hospitalizations is considered a problem, as reflected by the term "revolving door", and it has gained interest in recent years. It burdens the healthcare system and has significant financial implications (12). Various definitions have been used for "revolving door patients", including in adolescent psychiatry: a new admission within a year of discharge (13), two or more treatment episodes within 6 months of discharge (11) and a new admission within three months after discharge (14).

The occurrence of rapid readmission has been considered indicative of poor treatment quality, and readmissions have incurred significant costs to the healthcare system (15). However, when examining the revolving door phenomenon, the suitability of rapid readmission as a measure of treatment quality should be considered carefully. In somatic studies in the United States, problematic readmission is often defined as readmission within 30 days of discharge (12). In psychiatry the majority of readmissions occur between 30 and 90 days after discharge, and longer follow-up times have been used in defining problematic readmissions (9,10). However, in psychiatric illnesses, an actual cure during inpatient treatment is rarely expected. The goal is to alleviate symptoms, improve functioning, or support the patient through the exacerbation phase of the illness. Therefore, a new inpatient treatment episode may be quite anticipated and part of the normal course of a chronic illness. This should be taken into account when using a longer follow-up period for defining revolving door patients (16). Another challenge in psychiatric readmissions arises from the nature of psychiatric illnesses. It can be difficult to determine whether a psychiatric patient is truly readmitted for the same or a different reason as the last time. Psychiatric patients may present with various reasons and symptoms that are related to the same underlying illness. For example, a decline in functioning and suicidality related to schizophrenia may be separate reasons for hospitalization, but the underlying disease is the same. The nature of psychiatric comorbidity has been the subject of much debate. For instance, can the illnesses of a patient with both depression and anxiety be considered separate entities, or are they part of a single phenomenon for which our diagnostic system provides two terms (17)?

In adolescent psychiatry, known factors contributing to the revolving door phenomenon are primarily related to the severity of the patient's symptoms and overall functioning (10,14). This is likely associated with the observed correlation between the length of hospitalization and readmissions (18). Some clinical features, such as suicidal thoughts and behaviour, have been strongly linked to new hospitalization episodes (19,20). Additionally, social factors may influence

the revolving door phenomenon (13). Single parenthood and living in foster care, at least, seem to increase the risk of the revolving door phenomenon, although there is not a substantial amount of research on this topic (21,22). On the other hand, substance use has not been found to increase the risk of the revolving door phenomenon (13).

The impact of different diagnoses on the revolving door phenomenon is unclear. Some studies suggest that individuals with psychosis, schizophrenia and bipolar disorder are at a higher risk of experiencing the revolving door phenomenon (18), while other studies do not find a clear association between various diagnoses and the revolving door phenomenon (13). On the other hand, autism spectrum disorder and intellectual developmental disabilities appear to be associated with an increased risk of readmission, although the evidence for this is not very robust (18). Observations regarding the significance of patient age in the revolving door phenomenon in youth psychiatry are conflicting. The role of gender in readmission risk is unclear, but there are indications that different risk factors may influence readmission for girls and boys (18).

The revolving door phenomenon imposes significant costs on the healthcare system and diminishes the quality of life for many patients. Currently, research evidence on various factors related to the revolving door phenomenon, such as patient diagnoses, age, gender and social situations, is conflicting. In order to prevent this phenomenon and allocate healthcare resources effectively, more precise information on potential risk factors is needed. The objective of this study is to gather more detailed information on the sociodemographic and clinical characteristics of adolescent psychiatric patients experiencing the revolving door phenomenon. Our research questions are as follows:

1. What is the prevalence of patients admitted to adolescent inpatient care returning for a new adolescent psychiatric inpatient treatment episode by age 18 in general and what proportion returns to hospital within 30 days?
2. What sociodemographic, psychosocial and disorder- and symptom-related factors predict the occurrence of new inpatient treatment episodes by age 18 in general and within 30 days after the completion of an inpatient episode?

MATERIALS AND METHODS

All patients admitted to adolescent psychiatric inpatient care at Tampere University Hospital between 2016 and 2020 were identified from the hospital databases. A retrospective chart review in study hospital's databases was involved. For each patient's first treatment episode (= index episode), structured forms were used to collect information on the patient's gender, age, any potential involvement with child protective services, admission and discharge dates of the treatment episode, diagnoses, observed symptoms during the treatment episode and any concerning family-related factors. The admission and discharge dates of any possible subsequent inpatient treatment episodes in adolescent psychiatric ward were also documented. The data were collected with the permission of the Director of Research, Development and Innovation Centre at Tampere University Hospital. Patients were not contacted for the purposes of this study. Ultimately, the dataset included 1427 individuals aged 13-17 admitted to inpatient care, comprising 1120 females and 307 males.

MEASURES

Variables related to readmissions used were: 1) any readmission before age 18, 2) readmission within 30 days, and 3) number of readmissions before age 18.

First four diagnoses marked in each patients discharge summary were recorded according to the ICD-10 classification system and used in analyses categorized into the ICD-10 main classes of mental health disorders, such as F00-09, F10-19, F20-29 and so forth.

Psychiatric symptoms were documented based on a 21-item checklist of adolescent psychiatric symptoms, with each symptom marked as yes/no for both the time of the referral and the duration of the inpatient episode (see *Table 1*). Stressful family factors were similarly assessed using a 10-item checklist, whether they had been recorded in the medical records during the index treatment episode as relevant to the adolescent, with each factor marked as either present or absent. The 10 family adversities recorded were: family violence, parental substance use problems, parental divorce or separation, bereavement, parental severe somatic illness, parental severe mental disorder, severe financial difficulties, severe problems related to siblings, (suspected) sexual abuse within the family and other. These checklists have been utilized in several previous studies describing and comparing

different patient samples' symptom and risk factor profiles (23–25). Any involvement of child welfare services in the adolescent's life was recorded dichotomously (yes/ no).

Table 1. The symptom[1] distribution of adolescents admitted to psychiatric inpatient care in Tampere university hospital between 2016 and 2020

Symptom	% of patients (n of patients) (N=1472)
Suicidal ideation & talk	80.2 (1144)
Suicide attempt	14.1 (201)
Self-harming behaviour	57.6 (822)
Positive psychotic symptoms	39.7 (567)
Depression	70.9 (1012)
Manic behaviour	4.5 (64)
Non-physical aggression towards other people	13.6 (194)
Temper tantrums	12.3 (176)
Violent behaviour towards other people	13.8 (197)
Breaking and destroying property	10.3 (147)
Inappropriate sexual behaviour	7.8 (112)
Alcohol abuse	15.5 (221)
Substance use	8.8. (126)
Truancy/school refusal	33.8(482)
Property crimes	2.5 (35)
Eating disorder symptoms	23.1 (330)
Isolation	8.8 (125)
Impulse control problems	17.7 (253)
Running away	15.0 (214)
Anxiety	86.9 (1240)
Attention problems	12.3 (175)

[1]Each symptom was marked as yes/no for both the time of the referral and the duration of the inpatient episode

STATISTICAL ANALYSIS

We used cross-tabulation to investigate the associations gender, involvement with child protective services, various diagnoses and symptoms with the categorical outcome variables, and t-test to study their associations with continuous outcome variables. Multivariable models were used, Cox regression to predict readmission by age 18, as Cox regression accounts for differences in follow-up times, and logistic regression to explore risk of readmission within 30 days. In the Cox regression analyses, follow-up time was used until the first readmission or until the end of 2021 (whichever earlier), and it was mean (sd) 1.9 (1.8) years, median 1.3 years. Age, gender, child welfare contact and a) psychiatric diagnoses, b) symptoms and c) family adversities were entered as independent variables. Due to multiple testing the cut-off for statistical significance was set at p<0.01.

RESULTS

The average age of the patients was 15.1 (sd 1.4) years. There was no difference in age distribution based on gender (p=0.58). Child welfare services were involved in the lives of 67.6% (963) of the patients, with no difference between males and females. The most common symptoms were anxiety, suicidal ideation and depression (*Table 1*). The main diagnosis as well as the first three secondary diagnoses were considered patients' diagnoses. Severe mood disorders (F30-39) were the most common diagnosis recorded. The distribution of different diagnoses is presented in *Table 2*.

Among the 1427 adolescents included in the study, 48.4% (694) experienced rehospitalization in adolescent psychiatric ward during the follow-up time. Mean (sd) number of readmissions was 1.3 (2.3). When categorizing patients based on the number of readmissions into four groups (0, 1, 2-3, and 4 or more readmissions), 51.2% (731) had none, 21.1% had one readmission, 16.7% had 2-3 readmissions, and 10.9% had 4 or more readmissions. Among all patients, 13.0% returned to the hospital within 30 days. Among those who had any readmission, 26.9% returned within 30 days.

Bivariate associations of the readmission variables with gender and diagnoses of the patients are presented in *Table 3*. Female gender was predictive of any readmission, readmission within 30 days and greater average number of readmissions. Any readmission was predicted by diagnosis in schizophrenia group (F20-29), diagnosis in somatoform diagnosis group (F50-59) and by having a child welfare contact. Greater average number of readmissions was predicted by diagnosis in groups F20-29, F30-39, F70-79, F80-89, F90-99 and by child welfare contact (*Table 3*).

Of the 10 family adversities, two recorded at index admission were predictive of readmission to adolescent psychiatric inpatient care in bivariate analyses. Statistically significant factors included parental substance abuse issues and severe parental mental health disorders. In families with substance abuse problems, the probability of readmission was 59.0%, compared to 48.8% without substance abuse issues (p<0.01). Severe parental mental health disorders increased the likelihood of readmission (47.5% vs. 58.6%, p<0.01). Documented symptoms that were significantly associated with readmissions in bivariate level included self-harm (52.9% vs. 42.6%, p<0.01), psychotic symptoms (56.4% vs. 42.4%, p<0.01) and eating disorder symptoms (60.0% vs. 45.1%, p<0.01). Conversely, troubling alcohol use (38.9% vs. 50.2%, p=0.01) and the use of illegal substances (34.9% vs. 49.9%, p=0.01) were associated with reduced readmissions.

Multivariable associations of gender, age, child welfare contact and psychiatric diagnoses with readmissions, using Cox regression accounting for different follow-up times, are presented in *Table 4*. Girls, adolescents younger at index admission and those in child welfare contact had increased risk to be readmitted, as had those with a diagnosis in schizophrenia group (F20-29), severe mood disorder (F30-39), anxiety disorders (F40-48) or somatoform disorders (eating disorders) (F50-59) (*Table 4*). When examining readmission within 30 days of discharge, increased risk was associated with female gender and borderline statistically significant with diagnosis in pervasive developmental disorders group (F80-89) (*Table 5*).

Among the symptoms documented, self-harm (HR 1.3, 95% CI 1.1-1.5), psychotic symptoms (HR 1.5, 95% CI 1.3-1.8) and eating disorder symptoms (HR 1.6, 95% CI 1.3-1.9) increased the risk of readmission in multivariable model. On the other hand, depressive symptoms decreased the risk of readmission (HR 0.8, 95% CI 0.6-0.9). Risk of readmission was increased in girls (HR 1.5 (1.2-1.8), p<0.01) and borderline statistically significant with child welfare contact (HR 1.3 (1.1-1.5), p=0.01). None of the symptoms documented predicted statistically significantly return to hospital within 30 days in multivariable analysis; the risk related to eating disorder symptoms approached statistical significance (OR 1.8 (1.2-2.6), p<0.01), and the risk associated with female gender was borderline statistically significant (OR 1.9 (1.1-3.2), p=0.01).

None of the family adversities predicted readmission to adolescent psychiatric ward in general or within 30 days in multivariable analyses. Child welfare contact did not emerge as statistically significantly associated with readmission outcomes when family adversities were in the same model, but female gender yielded increased risk (HR 1.7 (1.3-2.0), p<0.01 for readmission in general, OR 1.9 (1.2-2.9), p=0.01 for readmission within 30 days).

Table 2. Psychiatric diagnoses among 13-17-year-olds admitted to adolescent psychiatric ward in 2016-2020. More than one diagnosis can be recorded, so the percentages do not sum to 100%

Diagnostic group	% of patients (n of patients)
F00-09	-
F10-19	3.9 (55)
F20-29	12.5 (179)
F30-39	64.4 (919)
F40-48	47.0 (671)
F50-59	12.6 (180)
F60-69	0.5 (7)
F70-70	11.5 (164)
F80-89	11.5 (164)
F90-99	27.3 (390)

Table 3. Bivariate associations of readmissions by age 18, readmissions within 30 days and number of readmissions with gender, psychiatric diagnoses and child welfare contact at index admission. Associations statistically significant at level p<0.01 are highlighted in bold

	Readmission by age 18 (%)	Readmission in 30 days (%)	Number of readmissions (mean (sd))
Gender			
girl (1152)	**52.0**	**14.3**	**1.5 (2.5)**
boy (320)	**37.2**	**8.1**	**0.6 (1.0)**
F10-19			
no (1415)	49.3	13.1	1. (2.1)
yes (57)	36.8	9.1	1.3 (2.3)
F20-29			
no (1285)	**47.4**	12.7	**1.2 (2.2)**
yes (187)	**58.3**	14.5	**1.9 (3.0)**
F30-39			
no (530)	46.8	12.8	**1.1 (1.9)**
yes (942)	49.9	13.1	**1.5 (2.5)**
F40-48			
no (785)	47.1	13.2	1.2 (2.2)
yes (687)	50.7	12.7	1.4 (2.4)
F50-59			
no (1286)	**47.5**	12.4	1.3 (2.2)
yes (186)	**57.5**	16.7	1.7 (2.7)
F60-69			
no (1465)	48.6	13.0	1.3 (2.3)
yes (7)	85.7	0.0	1.1 (0.7)
F70-79			
no (1302)	47.8	12.2	**1.3 (2.1)**
yes (170)	55.9	18.9	**1.8 (3.3)**
F80-89			
no (1302)	47.8	12.2	**1.3 (2.1)**
yes (170)	55.9	18.9	**1.8 (3.3)**
F90-99			
no (1074)	48.1	12.2	**1.2 (2.1)**
yes (398)	50.5	15.1	**1.6 (2.8)**
Child welfare contact			
no (483)	**42.9**	11.9	**1. (1.8)**
yes (986)	**51.6**	13.4	**1.5 (2.5)**

Table 4. Hazard ratio (HR) with 95% confidence intervals (95% CI) for readmission to adolescent psychiatric inpatient care among 13-17-year-old adolescents psychiatrically hospitalized in 2016-2020, according to age, gender, child welfare contact and psychiatric diagnoses at index admission

	HR (95% CI)	p-value
Age at index admission (cont.)	**0.8 (0.8-0.9)**	**<0.01**
Gender (girl)	**1.7(1.3-2.1)**	**<0.01**
Child welfare contact	1.2 (1.0-1.5)	0.01
F10-19	0.8 (0.5-1.3)	0.5
F20-29	**2.0 (1.6-2.5)**	**<0.01**
F30-39	**1.3 (1.1-1.6)**	**<0.01**
F40-48	**1.2 (1.1-1.5)**	**<0.01**
F50-59	**1.6 (1.3-2.0)**	**<0.01**
F60-69	1.9 (0.8-4.4)	0.112
F70-79	1.1 (0.1-1.7)	0.7
F80-89	1.4 (1.1-1.8)	0.01
F90-98	1.2 (1.0-1.5)	0.03

Table 5. Odds Ratio (OR) with 95% confidence intervals (95% CI) for readmission within 30 days among 13-17-year-old adolescents psychiatrically hospitalized in 2016-2020, according to age, gender, child welfare contact and psychiatric diagnoses at index admission

	OR (95% CI)	p-value
Age at index admission (cont.)	0.9 (0.8-1.0)	0.08
Gender (girl)	**2.0 (1.3-3.2)**	**<0.01**
Child welfare contact	0.9 (0.6-1.3)	0.6
F10-19	0.8 (0.3-2.0)	0.6
F20-29	1.4 (0.9-2.3)	0.2
F30-39	1.1 (0.8-1.5)	0.7
F40-48	1.0 (0.7-1.4)	0.8
F50-59	1.5 (1.0-2.4)	0.07
F60-69	-	-
F70-79	1.1 (0.4-2.6)	0.9
F80-89	1.9 (1.2-3.0)	0.01
F90-98	1.4 (1.0-2.1)	0.07

DISCUSSION

Our goals were to determine the prevalence of readmissions to adolescent inpatient care in general and to figure out what proportion returns to hospital within 30 days. In addition, we wanted to figure out possible factors that might predict readmissions generally or within 30 days of completion of inpatient episode. Almost half of the patients experienced readmission at some point before coming 18 years of age, and 13% of patients experienced readmission within 30 days of discharge. The most influential factors contributing to readmission risk were female gender, diagnosis within the schizophrenia group (F20-29), diagnosis within the mood disorder group (F30-39), diagnosis within the somatoform disorder group (F50-59), and symptoms related to self-harm, psychosis and eating disorders. Additionally, problematic parental substance use and mental health issues were significantly associated with readmissions in bivariate level but not in multivariable models.

Almost half (48.4%, 694) of adolescents in our study experienced readmission before legal adulthood. Out of those, a little over one fourth (26.9%) returned to the hospital within 30 days; in the total group the 30-day readmission rate was 13.0%. In comparison to other studies the overall readmission rate during follow-up time seems quite high, but there are some explaining factors. The average time at risk was longer than on earlier comparable studies, even up to four years (10,18,21,26–29). Almost forty per cent of our patients presented with positive psychotic symptoms, which may suggest a higher share of emerging psychotic illness as compared to many other studies (21,29,30) with mainly suicidal patients or fewer psychotic patients perhaps suggesting resolvable crises. Differences in healthcare systems, resources and treatment guidelines may of course also influence readmission rates in adolescent psychiatry. When examining the 30-day readmission rates our results are quite in line with other studies, but still slightly higher (21,26,29).

Overall, in the bivariate analyses the risk of readmission was increased by female gender, diagnosis within the schizophrenia group, diagnosis within somatoform group and by child welfare contact. These findings strengthen previous evidence and are in line with our previous understanding. These diagnosis groups encompass diseases with chronic nature and with cumulative risk of relapse increasing over time (31–36). Additionally, these diseases might be more readily treated as legitimate illnesses by parents, and could be characterized by more limited ability of parents to cope with symptomatic adolescent at home when compared to disorders in other diagnosis groups, thus increasing hospital admissions. Multivariate analysis gave similar results. In addition to female gender, child welfare contact and diagnoses within schizophrenia and somatoform disorder groups, a diagnosis within mood disorder group also predicted readmission in multivariate analyses. Some studies have indicated that diagnoses within developmental and pervasive developmental disorder groups (F70-79 and F80-89) may increase the risk of readmission (18). In our data they increased the mean number of readmissions along with female gender and diagnosis groups F20-29, F30-39, F90-99 as well as child welfare contact, but their significance did not carry on to multivariate model accounting for other diagnoses.

Female gender was the only statistically significant factor increasing readmission risk within 30 days in bivariate or multivariate analysis, further corroborating previous findings of increased readmission risk among females (13). There could be several reasons for this finding. Girls tend to experience and express more negative emotion than boys (37) which may contribute to them being more likely to return to the hospital than boys. In addition, healthcare personnel and family members may be more sensitive towards girls, whereas boys might be perceived as more capable of managing on their own or their symptoms might be more easily dismissed as "normal". Conversely, female patients may be more likely to seek treatment, while male patients might attempt to cope independently.

On symptom level, psychotic symptoms, self-harm and eating disorder symptoms were found to increase the risk of readmission. Particularly, the association between self-harm and readmissions has been established for a considerable period, but the impact of psychotic and eating disorder-related symptoms on readmission risk has received comparatively less scrutiny (10,19,20). These symptoms often indicate a severe psychiatric disease that requires professional attention and as such may be particularly alarming for the environment and trigger desire to have the adolescent hospitalized. Factors decreasing readmission risk included depressive symptoms as well as concerning alcohol and substance use by the patient, a finding previously noted (18). This may appear unexpected. However, depressive symptoms may increase the young person's desire to get help and adhere to community care, which would then decrease readmissions to inpatient care. Additionally, community care might be able to better respond to adolescent depressive symptoms than to some other symptom complexes, leading to decrease in readmissions. Individuals with substance use

issues on the other hand may rather be directed towards child welfare interventions. Substance abuse is nevertheless known to complicate psychiatric illnesses, and young individuals with substance use issues and co-occurring mental health problems require special care to combat both problems at the same time, even if psychiatric inpatient care may not be a first-line treatment option.

Of the recorded family adversities, parental severe mental illness and parental substance abuse predicted readmission in bivariate analyses. However, their significance diminished in multivariate analysis. Other family factors did not reach statistical significance. Earlier studies are inconclusive about the role of parental psychiatric morbidity on readmissions. While most studies have not found a relation between parental psychiatric morbidity and readmissions (13,18,19,38), there are others who have found a clear correlation (39). The relatively small importance of family factors on psychiatric readmissions could be explained, for instance, by effective child welfare interventions. However, the possible effects of parental substance abuse and severe parental mental illness on readmission should not be ignored when estimating the risk of readmission of patients and, on the other hand, the limited significance of family factors in our study may also be partly attributed to the retrospective case history-based nature of the research. There may be under-reporting of family issues in patient charts.

The strength of the study is the unselected data. We had access to a large and representative dataset, which was not filtered in any way. This minimizes selection bias and increases the reliability of our findings. Patient data were collected from case histories using structured forms, which standardizes the information and increases its reliability. The study hospital provides the only adolescent psychiatric inpatient ward for a population of a well-defined catchment area. Our study has some limitations. Firstly, we collected data from only one hospital, and while it is representative of a specified catchment area's adolescent inpatient care, possible regional variations cannot be examined in this study. Generalizability beyond Finland may also be compromised due to differences in health service systems. Secondly, in a retrospective chart review-based study, the data is only as comprehensive and nuanced as the case histories. While the most essential symptoms and diagnoses are recorded, some information may be missing from the files.

CONCLUSION

The readmission rates were higher than reported in other studies. This is likely partially influenced by the longer follow-up times in the present study, but it should also be noted that these studies were conducted abroad and thus differences between healthcare systems and treatment guidelines might also play a role. Higher readmission rates may also suggest unnecessarily short inpatient treatment episodes or inpatient treatment-centred care. On the other hand, readmissions were related to severe disorders that often have a chronic course. Patients diagnosed with schizophrenia group disorders and those exhibiting psychotic symptoms, as well as those diagnosed with somatoform group disorders and presenting with eating disorder symptoms or self-harm symptoms, are readmitted to the hospital more frequently than other patients. Readmissions of such patients likely do not necessarily represent failure of treatment, or a problematic "revolving door" phenomenon. Special attention should nevertheless be paid to the care and discharge planning for these patients with a high readmission risk, and potential areas for improvement should be identified. Gender inequality in readmissions may deserve societal attention.

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