

Diagnosis-specific disability pension predicts suicidal behaviour and mortality in young adults: a nationwide prospective cohort study

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ABSTRACT

Objectives: Increasing rates of disability pension (DP), particularly owing to mental diagnoses, have been observed among young adults in Organisation for Economic Co-operation and Development (OECD) countries. There is a lack of knowledge about the health prognosis in this group. The aim of this study was to investigate whether DP in young adulthood owing to specific mental diagnoses or somatic diagnoses predicts suicidal behaviour and all-cause mortality.

Design: A nationwide prospective cohort study.

Setting: A register study of all young adults who in 2005 were 19–23 years old and lived in Sweden. Registers held by the National Board of Health and Welfare, Statistics Sweden and the National Social Insurance Agency were used.

Participants: 525 276 young adults. Those who in 2005 had DP with mental diagnoses (n=8070) or somatic diagnoses (n=3975) were compared to all the other young adults in the same age group (n=513 231).

Outcome measures: HRs for suicide attempt, suicide and all-cause mortality in 2006–2010 were calculated by Cox proportionate hazard regression models, adjusted for sex, country of birth, parental education and parental and previous own suicidal behaviour.

Results: The adjusted HR for suicide attempt was 3.32 (95% CI 2.98 to 3.69) among those on DP with mental diagnoses and 1.78 (95% CI 1.41 to 2.26) among those on DP with somatic diagnoses. For the specific mental diagnoses, the unadjusted HRs ranged between 2.42 (mental retardation) and 22.94 (personality disorders), while the adjusted HRs ranged between 2.03 (mental retardation) and 6.00 (bipolar disorder). There was an increased risk of mortality for young adults on DP in general, but only those with mental DP diagnoses had a significantly elevated HR of completed suicide with an adjusted HR of 3.92 (95% CI 2.83 to 5.43).

Conclusions: Young adults on DP are at increased risk of suicidal behaviour and preterm death, which emphasises the need for improved treatment and follow-up.

ARTICLE SUMMARY

Article focus

- Does disability pension in young adulthood owing to specific mental diagnoses or somatic diagnoses predict suicidal behaviour and mortality?
- To what extent can such an association be explained by previous suicide attempts, demographic factors and known parental risk factors?

Key messages

- Disability pension with mental diagnoses as well as somatic diagnoses in young adulthood is associated with an excess risk of suicidal behaviour and mortality.
- Young adults awarded disability pension for personality disorders and bipolar disorder were at particularly high risk, whereas those awarded disability pension for any of the other investigated mental disorders showed an excess risk compared to young adults of the same age group without disability pension.
- The excess risk for suicidal behaviour in young adults on disability pension in general remains after adjustment for demography, parental suicidal behaviour, and own earlier suicide attempts.

Strength and limitations of this study

- The study benefited from a nationwide coverage, a long follow-up, practically no loss to follow-up, and adjustment for a wide range of potential confounders.
- Only suicide attempts that resulted in inpatient care were included, which might have resulted in an underestimation.
- This study does not permit conclusions about the underlying mechanisms.

INTRODUCTION

Disability pension (DP) in young adults, particularly due to mental diagnoses, has increased dramatically in Sweden and other Organisation for Economic Co-operation

and Development (OECD) countries during the last couple of decades.^{1–3} In several countries, this increase has been especially high among individuals below the age of 25. In Sweden, DP can, in this age group, be granted for a limited number of years if disease or injury has impaired the individuals' work capacity for a long time or delayed completion of upper secondary school.⁴ The probability of paid work after some years on DP is low, and being granted DP might thus trap the individual in inactivity and poverty.⁵

The majority of DPs granted to young adults is due to mental diagnoses, such as mental retardation, hyperkinetic disorder, pervasive developmental disorders, unipolar depression, personality disorders and neurotic disorders.^{1–2} In contrast to many other disabling disorders, many of the most prevalent mental disorders typically have an onset in childhood or adolescence.⁶ These disorders often continue into adulthood in the form of chronic conditions, residual symptoms, recurrent episodes or onset of comorbid conditions.^{7–8} Mental disorders often have adverse effects on role transition from adolescence to adulthood^{9–10} and are associated with severe work impairment.¹¹ In addition, a wide range of mental disorders in young adulthood have been shown to be associated with all-cause mortality.^{12–13}

Apart from the natural course and health risks associated with the disorders for which DP is awarded, there are additional reasons to pay close attention to the mental health status of young adults on DP. With regard to the long-term outcomes, an increased risk of all-cause and cause-specific mortality has been reported, regardless of the underlying DP diagnoses.^{14–16} According to two previous studies, being granted DP seems to be associated with an increased risk of suicide, especially when adjusting for previous psychiatric hospitalisation, socioeconomic status and other risk factors like parental suicidal behaviour, DP and educational level.^{17–18}

Empirical data that allow conclusions about the consequences of DP per se are scarce, however, and there is a lack of knowledge about both the short-term and long-term effects on mental health.¹⁹ A few studies have investigated changes in mental health status during the transition to DP. Two recent studies found that self-reported symptoms of depression and anxiety as well as purchase of prescribed antidepressants increased before a DP was granted, after which a decrease was noted.^{20–21} However, DP granted in early adulthood might have different and more profound effects than when granted later in life. The transitional years between adolescence and adulthood have been described as a period of identity exploration when different work possibilities can be tried out.²² Further, this period can be critical for the continuity or discontinuity of psychopathology.²³ The ability to earn one's own income is regarded as a major milestone in the transition to adulthood.²⁴ Also, for most people, paid work provides not only financial stability but also, for example, a sense of meaning and self-esteem, which are important for physical and mental

health.^{25–26} Exclusion from the labour market in young adulthood might lead to marginalisation, social isolation and loss of purpose and self-esteem, conditions that are likely to be detrimental to mental health.^{27–28} Improved knowledge about the risk of suicide and suicidal behaviour in young people granted DP for different mental diagnoses could help identify groups in particular need of preventive interventions.

Aim

The aim of this study was to investigate whether DP in young adulthood, owing to specific mental diagnoses or somatic diagnoses, predicts suicidal behaviour (suicide attempt and suicide) and all-cause mortality. This was studied in general and after adjustment for sex, country of birth, previous own suicide attempts, parental education and parental suicidal behaviour. Parental suicidal behaviour was included alongside the socioeconomic and demographic factors, as this has been shown to be associated with suicidal behaviour in the offspring.²⁹

METHOD

Study population and design

This is a nationwide prospective cohort study with a 5-year follow-up. All data were obtained from the Swedish national registers. The cohort included all individuals who were 19–23 years old on 31 December 2005 and had lived in Sweden throughout 2005 (N=525 276, 48.7% women). They were followed up regarding suicide attempt, suicide and all-cause mortality from 1 January 2006 to 31 December 2010.

Outcome measures

Information on suicide attempt and death was obtained from the National Patient Register and the Cause of Death Register, held by the National Board of Health and Welfare. Suicide attempts and completed suicides were classified according to the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10),³⁰ defined by the codes X60–X84 and Y10–Y34. Codes with uncertainty about intention (Y10–Y34) were also included, primarily in order to limit temporal and regional variation in ascertainment routines.^{31–32} A sensitivity analysis excluding uncertain suicide attempts and suicides revealed the estimates to be similar.

Information from the different registers was merged by means of the unique identification number assigned to each resident in Sweden. Children were linked to their biological parents using the Multi-Generation Register, which is held by Statistics Sweden and contains links between children and their parents.

Exposure

Exposure was defined as receiving DP benefit in 2005. Data on the main DP diagnosis were obtained from the National Social Insurance Agency. The diagnoses were

classified according to ICD-10 and categorised into mental disorders (F00–F99) and somatic disorders (all other diagnostic codes), respectively. Information about DP diagnosis was missing for 556 individuals (4.6% of all DPs). The outcome of this group was similar to that of the somatic group. The two categories (somatic and missing) were therefore combined. A sensitivity analysis excluding individuals with missing information revealed the estimates to be similar.

In the analyses of suicide attempts, mental DP diagnoses were subdivided into the most frequent DP diagnostic groups, namely: schizophrenia, schizotypal and delusional disorders (F20–F29); bipolar affective disorder (F30–F31); unipolar depression (F32–F33); neurotic, stress-related and somatoform disorders (F40–F49); personality disorders (F60–F61); mental retardation (F70–F79); pervasive developmental disorder (F84); hyperkinetic disorder (F90); and other mental disorders (F00–F19, F34–F39, F50–F59, F62–F69, F80–F83 and F85–F99). In the analyses of suicide and death, this subdivision into different diagnostic groups was not possible, owing to a lack of power.

Covariates

Information about sex, country of birth and parental education was obtained from the Longitudinal Integrated Population-based Database for Labor-market Research (LISA) held by Statistics Sweden, linked with the Multi-Generation Register for information on parents. Country of birth was classified as either Sweden or other (missing information was categorised as other). Parental level of education in 2000 was classified as low (compulsory school or less, ≤ 9 years), medium (upper secondary school, 10–12 years), high (college or university, >12 years) or missing information. We used either maternal or paternal education, whichever was the highest, in accordance with the dominance principle.³³ This approach has been shown to perform well in classifying the social status of families. Information on parental suicide attempts between 1964 and 31 December 2005 was obtained from the National Patient Register and defined by the ICD-9 codes E950–E959 and E980–E989 or the ICD-10 codes X60–X84 and Y10–Y34. Information on parental suicide from the year when the child was born to 31 December 2005 was obtained from the Causes of Death Register. Events of parental suicide attempts or suicides were combined into one dichotomised measure of suicidal behaviour.

Statistics

We calculated the HRs with 95% CI of suicide attempt, suicide, mortality due to reasons other than suicide and all-cause mortality with Cox proportional hazard regression models, using person-time during follow-up as the underlying timescale. The data conformed to the proportional hazards assumption. Individuals were followed from 1 January 2006 to the event, death (when relevant), emigration and end of follow-up (31 December

2010), whichever came first. We performed both univariate and multivariate analyses. In a first set of analyses, DP with mental diagnoses and DP with somatic diagnoses were contrasted to no DP (reference category). In a second set of analyses, DP owing to all the major categories of mental diagnoses and the category of other diagnoses were contrasted to no DP (reference category). The statistical analyses were performed with IBM SPSS 20.

Venn diagrams were created with R V.2.13.2. The three areas were represented by suicide attempts before 2006, suicide attempts during follow-up, and mortality during follow-up. A fourth area, representing suicides during follow-up, was inserted in the area representing mortality.

Ethics

The study was approved by the Regional Ethical Committee in Stockholm, Sweden (protocol nr 2007/762–31).

RESULTS

Participants

The cohort consisted of 525 276 individuals (48.7% women). During the follow-up period, 8576 (1.6%) of the individuals (8547 without DP; 9 with somatic DP; 20 with mental DP) emigrated and were censored in the year this information was registered.

Descriptive data

About two-thirds of the DPs were due to mental diagnoses ($n=8070$, 45% women) and one-third due to somatic diagnoses ($n=3975$, 47% women; [table 1](#)). Among all the DPs that were due to mental diagnoses, mental retardation was the largest group (36%), and pervasive developmental disorder was the second largest (19%). Information on the country of birth was missing for 27 individuals (0.01%), none of whom were on DP. Overall, 17 328 (3.3%) of the individuals (16 832 without DP; 123 with somatic DP; 373 with mental DP) had missing information on education for both parents.

Suicide attempts

In total, 4908 individuals were hospitalised at least once owing to suicide attempts during the 5-year follow-up (2006–2010; [table 2](#)). In the univariate analysis, DP owing to mental diagnoses was associated with a sixfold increased risk of suicide attempt, compared to DP owing to somatic diagnoses with a twofold increase. While all major categories of mental diagnoses had an increased HR of suicide attempt, particularly high HRs were observed for bipolar affective disorder (HR 22.16; 95% CI 12.86 to 38.20) and personality disorders (HR 22.94; 95% CI 17.5 to 30.07).

Adjustment for sex, country of birth, parental education and parental suicidal behaviour had only a minimal effect on these estimates. Additional adjustment for

Table 1 Descriptive data of all young adults aged 19–23 years in 2005 and living in Sweden, subdivided into those on disability pension (DP) with mental or somatic diagnoses and those who were not on DP

	All n (%)	Not on DP n (%)	DP with mental diagnoses n (%)	DP with somatic diagnoses n (%)
Individuals	525 276 (100)*	513 231(97.71)*	8070 (1.54)*	3975 (0.76)*
Women	255 647 (48.67)†	250 160 (48.74)†	3629 (44.97)†	1858 (46.74)†
Men	269 629 (51.33)†	263 071 (51.26)†	4441 (55.03)†	2117 (53.26)†
Country of birth				
Sweden	460 648 (87.70)†	450 103 (87.70)†	7093 (87.89)†	3452 (86.84)†
Other	64 628 (12.30)†	63 128 (12.30)†	977 (12.11)†	523 (13.16)†
Parental education in 2000				
Low	45 203 (8.61)†	43 532 (8.48)†	1166 (14.45)†	505 (12.70)†
Medium	243 795 (46.41)†	23 7514 (46.28)†	4264 (52.84)†	2017 (50.74)†
High	210 559 (40.09)†	20 7115 (40.36)†	2183 (27.05)†	1261 (31.72)†
Missing information	25 719 (4.90)†	25 070 (4.88)†	457 (5.66)†	192 (4.83)†
History of suicidal behaviour				
Own attempt before 2006	7235 (1.38)†	6474 (1.26)†	664 (8.23)†	97 (2.44)†
Parental history of suicidal behaviour before 2006	25 682 (4.89)†	24 644 (4.80)†	775 (9.60)†	263 (6.62)†
Deaths 2006–2010				
Suicide	449 (100)*	404 (89.98)*	42 (9.35)*	3 (0.67)*
Other causes	873 (100)*	723 (82.82)*	44 (5.04)*	106 (12.14)*
Suicide attempts 2006–2010	4 908 (100)*	4 449 (90.65)*	389 (7.93)*	70 (1.43)*

*Proportion within row.

†Proportion within column.

previous suicide attempts attenuated the association between DP owing to mental diagnoses and suicide attempts during the follow-up period (HR 3.32; 95% CI 2.98 to 3.69). However, the HRs remained significant for all major categories of mental disorders. For those on DP owing to somatic diagnoses, adjustment for previous suicide attempts only had a small effect on the estimate (from HR 2.1 to 1.8).

Suicide, death due to other causes, and all-cause mortality

In total, 446 suicides occurred in the cohort during the period 2006–2010 (table 3). The HR for suicide was highest in the group on DP with mental diagnoses (HR 6.74; 95% CI 4.92 to 9.23). Adjustment for previous suicide attempts attenuated the association between DP owing to mental diagnoses and suicide, but it remained highly significant (HR 3.92; 95% CI 2.83 to 5.43).

Mortality owing to other causes was increased in the group on DP owing to mental diagnoses (HR 3.94; 95% CI 2.92 to 5.33), but was particularly high in the group on DP owing to somatic diagnoses (HR 18.85; 95% CI 15.36 to 23.13). Adjustment did not change these estimates substantially. The risk of all-cause mortality was about 5-fold for DP owing to mental diagnoses and 12-fold for other DP. Adjustment attenuated these estimates slightly.

A large proportion of the suicidal behaviours in the young adults on DP were preceded by previous suicide attempts (figure 1). In those on DP owing to mental diagnoses, 30% of the individuals who committed

suicide and 49% of those who made a suicide attempt during the follow-up period had made a suicide attempt before 2006. In those on DP owing to somatic diagnoses, one of the two suicides and 33% of the suicide attempts during follow-up were preceded by an attempt before 2006. This was in contrast to the proportions of previous suicide attempts in individuals not on DP, where 15% of the suicides and 14% of the suicide attempts during follow-up were preceded by an attempt before 2006.

DISCUSSION

Our population-based cohort study suggests that young adults on DP, particularly those owing to specific mental diagnoses, have an increased risk of suicidal behaviour. A substantially increased risk for both suicide attempts and suicide remained among those on DP owing to mental diagnoses even after adjustment for sex, country of birth, previous suicidal behaviour, parental suicidal behaviour and parental education. This was the case also within all the major categories of mental DP diagnoses. The risk of suicide attempts, but not of completed suicides, was also increased for the group on DP owing to somatic diagnoses. While the risk of premature death due to other causes was increased in DP owing to mental diagnoses, it was particularly high in the group with DP owing to somatic diagnoses.

Our results partly corroborate results from a Norwegian case-control study that investigated early-life risk factors for suicide.¹⁷ The Norwegian study found an increased risk of suicide among individuals on DP owing to mental diagnoses (schizophrenia in men and

Table 2 HR and 95% CI of suicide attempts in a 5 year follow-up (2006–2010) of all young adults (aged 19–23) with disability pension (DP) owing to somatic diagnoses and specific mental diagnoses in 2005

DP diagnoses	N	Suicide attempts n (%)	Crude HR (95% CI)	First adjustment HR (95% CI)*	Second adjustment HR (95% CI)†	Full adjustment HR (95% CI)‡
No DP	513 231	4449 (0.87)	1	1	1	1
DP, somatic diagnosis	3 975	70 (1.76)	2.05 (1.62 to 2.60)	1.97 (1.56 to 2.50)	1.94 (1.53 to 2.45)	1.78 (1.41 to 2.26)
DP, mental diagnosis	8 070	389 (4.82)	5.66 (5.11 to 6.28)	5.38 (4.85 to 5.97)	5.07 (4.56 to 5.62)	3.32 (2.98 to 3.69)
Mental retardation	2 868	60 (2.09)	2.42 (1.87 to 3.12)	2.16 (1.67 to 2.79)	2.07 (1.60 to 2.67)	2.03 (1.57 to 2.62)
Pervasive developmental disorder	1 542	43 (2.79)	3.23 (2.39 to 4.36)	3.51 (2.60 to 4.73)	3.33 (2.47 to 4.50)	2.68 (1.98 to 3.62)
Hyperkinetic disorder	684	39 (5.70)	6.66 (4.86 to 9.13)	6.85 (5.00 to 9.39)	6.25 (4.56 to 8.57)	3.99 (2.90 to 5.47)
Neurotic, stress-related and somatoform disorders	676	66 (9.76)	11.99 (9.4 to 15.28)	11.02 (8.64 to 14.05)	10.05 (7.88 to 12.82)	5.00 (3.91 to 6.39)
Schizophrenia, schizotypal and delusional disorders	320	29 (9.06)	10.95 (7.60 to 15.77)	11.47 (7.96 to 16.52)	10.69 (7.41 to 15.40)	4.87 (3.37 to 7.03)
Personality disorders	299	53 (17.73)	22.94 (17.5 to 30.07)	19.68 (15.01 to 25.82)	17.65 (13.45 to 23.16)	3.97 (3.01 to 5.24)
Unipolar depression	297	21 (7.07)	8.48 (5.52 to 13.01)	7.59 (4.94 to 11.66)	7.11 (4.63 to 10.92)	2.60 (1.69 to 4.00)
Bipolar affective disorder	75	13 (17.33)	22.16 (12.86 to 38.20)	21.69 (12.59 to 37.39)	19.13 (11.10 to 32.99)	6.00 (3.47 to 10.37)
Other mental disorders	1 309	65 (4.97)	5.82 (4.56 to 7.44)	5.36 (4.20 to 6.85)	5.08 (3.98 to 6.49)	3.65 (2.85 to 4.66)

*Adjusted for sex, country of birth and parental education.

†Additionally adjusted for parental suicidal behaviour.

‡Additionally adjusted for own previous suicidal behaviour.

Table 3 HR and 95% CI of death from suicide and other causes in a 5-year follow-up (2006–2010) of all young adults (age 19–23) living in Sweden with and without disability pension (DP) in 2005

Cause of death	Mortality n (%)	Crude HR (95% CI)	First adjustment HR (95% CI)*	Second adjustment HR (95% CI)†	Full adjustment HR (95% CI)‡
Suicide					
No DP	404 (0.08)	1	1	1	1
Mental diagnoses	42 (0.52)	6.74 (4.92 to 9.23)	6.40 (4.67 to 8.78)	5.80 (4.22 to 7.96)	3.92 (2.83 to 5.43)
Somatic diagnoses	3 (0.08)	0.64 (0.16 to 2.58)	0.62 (0.16 to 2.50)	0.60 (0.15 to 2.41)	0.54 (0.14 to 2.19)
Mortality from other causes					
No DP	723 (0.14)	1	1	1	1
Mental diagnoses	44 (0.58)	3.94 (2.92 to 5.33)	3.63 (2.68 to 4.90)	3.52 (2.60 to 4.76)	3.09 (2.28 to 4.20)
Somatic diagnoses	106 (2.40)	18.85 (15.36 to 23.13)	17.91 (14.59 to 21.99)	17.72 (14.43 to 21.76)	17.21 (14.01 to 21.14)
All-cause mortality					
No DP	1 127 (0.22)	1	1	1	1
Mental diagnoses	86 (1.13)	4.94 (3.98 to 6.14)	4.60 (3.70 to 5.72)	4.36 (3.50 to 5.42)	3.48 (2.78 to 4.34)
Somatic diagnoses	109 (2.47)	12.32 (10.11 to 15.02)	11.79 (9.67 to 14.38)	11.57 (9.49 to 14.11)	10.97 (8.99 to 13.38)

*Adjusted for sex, country of birth and parental education.

†Additionally adjusted for parental suicidal behaviour.

‡ Additionally adjusted for own previous suicidal behaviour.

schizophrenia and other mental diagnoses in women), but not for somatic diagnoses. Similarly, a Danish register-study showed that DP in general was associated with an increased risk of suicide in both men and women.¹⁸ Our results extend these results by showing that the increased risk applies not only for suicide but also suicide attempts, and that it applies to young adults on DP with a wide variety of mental diagnoses.

Adjustment for previous suicide attempts attenuated the HRs of suicide attempt in all categories of mental diagnoses, although this was particularly striking for disorders with a documented high risk of suicidal behaviour (eg, bipolar affective disorder and personality disorders).^{34 35} This suggests that although these disorders are identified by the healthcare system and are known to be associated with a high risk of suicidal behaviour, prevention of future events is not successful. It is not obvious to what extent this is the result of inadequate or suboptimal treatment or of shortcomings of the treatment methods that are currently available. In any case, these results show that close monitoring of the mental health status and adequate prevention strategies for suicidal behaviour of young adults on DP is warranted.

We observed an increased risk of suicide attempts in young adults on DP owing to somatic diagnoses. Interestingly, previous research has indicated that DP owing to both mental and somatic diagnoses is preceded by poor mental health. A Norwegian prospective cohort study observed that anxiety and depression were robust predictors of DP, even when DP owing to mental diagnoses was excluded.³⁶ Similarly, the results from a Swedish longitudinal population-based cohort suggest that over a quarter of the DPs awarded for somatic diagnoses could be attributed to psychological distress.³⁷ Furthermore, a Swedish register study of risk factors for early DP among men indicated similar risk pattern for DP with and without mental diagnoses.³⁸ These results, in combination with ours, underline the importance of bringing attention to the mental health status of young adults on DP owing to somatic diagnoses.

Although our results clearly stress the need for optimised treatment and care for young people on DP, they also raise important questions about how mental health is affected by early disability, exclusion from the labour force, and DP per se. Although the design of the

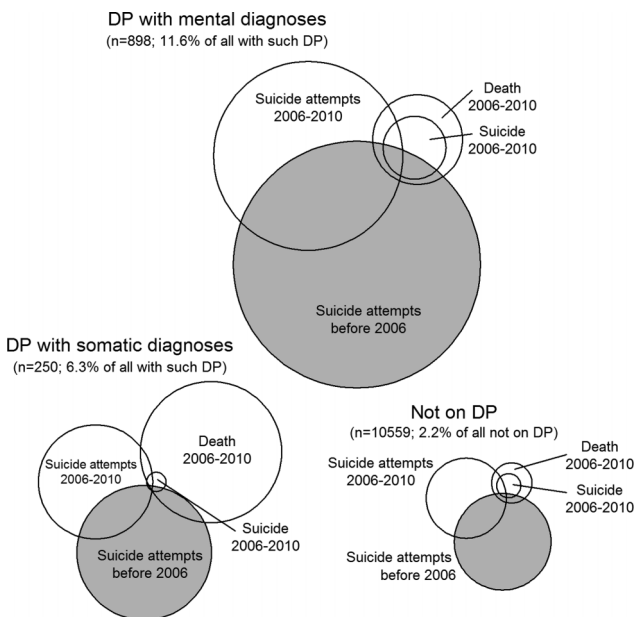


Figure 1 The overlap of suicide attempts, suicide and deaths from other causes (2006–2010) and previous suicide attempts (before 2006) in young adults (age 19–23) on disability pension (DP) with mental diagnoses, on DP with somatic diagnoses, or not on DP in 2005. The size of the figures corresponds to the proportion that is represented in the Venn-diagrams, illustrating the magnitude within each group. The number of individuals (n) and the proportion of each group (%) represented are presented for each Venn diagram.

present study precludes conclusions about the potential mechanisms, the results motivate studies into the positive and negative consequences of being granted DP early in life, in general and owing to specific diagnoses. DP could potentially have far-reaching psychosocial consequences for the individual's daily life. Early DP should therefore be put under scrutiny, in analogue with other medical and psychosocial interventions.

Methodological consideration

The strengths of this study include the population-based and very large cohort, including all inhabitants in Sweden fulfilling the inclusion criteria. The study also benefited from the long follow-up, with practically no loss to follow-up, and the wide coverage of potential confounders, among both the young adults and their parents. The high quality of Swedish register data is an additional strength.²⁹ The large cohort and the related high statistical power allowed us to estimate HRs also for DP owing to specific mental diagnoses, which is novel in this research field.

It should also be noted that although the results to some extent can be dependent on conditions specific to the Swedish society, similar trends regarding increases in DP in young adults have been observed in a number of other OECD countries. The results might therefore have relevance for other countries, with comparable social insurance systems.

However, our results should also be viewed in the light of some limitations. First, the validity of the DP diagnoses can be questioned. To the best of our knowledge, there is no study on the validity of DP diagnoses. However, one study exists on the validity of sick-leave diagnoses, showing high validity when comparing to diagnoses from medical records.³⁹ As there is still a substantial stigma connected with mental disorders, we, like others, generally assume that the validity of such DP diagnoses is higher than among somatic diagnoses. The high level of comorbidity among people with mental disorders in general also indicates a potentially substantial overlap of the diagnostic categories. Similarly, given the well-documented correlation between mental and somatic disorders, it is likely that at least some of the young adults with DP owing to somatic diagnoses also had mental disorders and vice versa. Further, diagnosis was missing in 4.6% of the individuals on DP. Thus, some amount of misclassification and overlapping categories is probable.

Furthermore, our analyses only included suicide attempts that resulted in inpatient care. It is likely that less severe cases are either treated in an outpatient setting or not recognised at all by the healthcare system. This may have resulted in a general underestimation of the incidence of suicide attempts and residual confounding, as not all previous own suicidal behaviour and parental suicidal behaviour were captured.

Finally, owing to a lack of power, it was not possible to study the risk of all-cause mortality separately for the

specific categories of mental disorders. The risk of these outcomes might differ from the risk of suicide attempts. Even larger data sets or longer follow-ups will be needed to address this question.

CONCLUSION

Young adults on DP are at increased risk of suicidal behaviour and preterm death. The increased risk of suicidal behaviour was particularly salient in DP owing to mental diagnoses, and both suicide attempt and suicide in this group are often preceded by suicidal behaviour. Close monitoring and further studies into the health and well-being of this group are warranted.

Contributors EMR and KA had principal responsibility for the core idea and the study design. They made substantial contributions to the analysis and interpretation of data, revised the manuscript critically for important intellectual content, and approved the final version to be published. UJ wrote the draft of the manuscript, made substantial contributions to the design and the analysis and interpretation of data, and approved the final version to be published. LK analysed the data, made substantial contributions to the design and interpretation of data, revised the manuscript critically for important intellectual content, and approved the final version to be published. HW made substantial contributions to the design and the analysis and interpretation of data, revised the manuscript critically for important intellectual content, and approved the final version to be published.

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