Sickness allowance histories among disability retirees due to mental disorders: a retrospective case-control study

Mikko Laaksonen[1], Jenni Blomgren[2], Annamari Tuulio-Henriksson[2,3]

1 The Finnish Centre for Pensions (ETK), 00065 Eläketurvakeskus, Helsinki, Finland

2 The Social Insurance Institution of Finland (KELA), P.O. Box 450, 00101 Helsinki, Finland

3 Institute of Behavioural Sciences, University of Helsinki, P.O. Box 9, 00014 Helsinki, Finland.

Corresponding author:

Mikko Laaksonen, Finnish Centre for Pensions, FI-00065 Eläketurvakeskus
Tel: +358 29 411 2156, Fax: + 358 29 411 2410, e-mail: mikko.laaksonen@etk.fi

Abstract

Objectives: To describe sickness allowance histories before disability retirement due to mental disorders and to examine whether receiving sickness allowance due to mental disorders and somatic conditions predicts future disability retirement.

Method: Pre-retirement sickness allowance histories were traced backwards for 7 years among Finnish residents aged 25-64 years who retired due to mental disorders in 2011 (n=5.544). For each retiree, 5 sex and age matched controls were drawn from the non-retired population. Conditional logistic regression was used to calculate the risk for disability retirement by sickness allowance history and to control for the effects of educational level, social class, marital status and urbanization level of municipality.

Results: The proportion of sickness allowance recipients increased steadily during the years preceding disability retirement, and was highest among those who retired due to bipolar disorders or depression. Those who had received sickness allowance due to mental disorders 6-7 years earlier had 6.5 times higher risk and those with sickness allowance 1-2 years earlier 11.7 times higher risk for disability retirement. Sickness allowance due to somatic conditions increased the risk for disability retirement 1.6-1.9 times. Sickness allowance most strongly predicted retirement due to bipolar disorders and depression. Adjustment for covariates had little effect.

Conclusion: Those who retired due to mental disorders more often had sickness allowance due to both mental disorders and somatic conditions, but in particular sickness allowance due to mental disorders predicted disability retirement due to mental disorders.

Introduction

Mental disorders are highly prevalent and constitute a substantial economic burden in the developed societies. Indirect costs that arise from production losses are the most highly-priced consequences of these disorders [1, 2]. On average, mental disorders cover one third of newly awarded disability benefits and account for a substantial part of all public spending in the OECD countries [3]. In addition, limitations in social and occupational functioning associated with these disorders can lead to poverty and social isolation at the personal level.

Identifying those who are at increased risk of long-term work disability and withdrawal from the labour market is a high priority in countries having pressures to extend working careers [4, 5]. Sickness absence, or the receipt of sickness allowance, may provide an important marker for people who are at risk for disability retirement. In most countries, a long sickness absence period is presumed before a disability pension can be granted. Thus, in the short-term an association between sickness absence and disability retirement is evident. Several studies have also shown that sickness absence predicts disability retirement for several years ahead [6-9] and the association is particularly strong for sickness absence based on mental disorders [8,9]. However, little is known about long-term development of sickness absence histories before disability retirement. Knowledge of such development is crucial as long-term sickness absence may be a first step in a process leading to permanent occupational disability.

Mental disorders constitute a heterogeneous group with variation in the average age of onset and functional limitations that follow [10]. Therefore, sickness absence histories for different mental disorders can be expected to vary. In the Dutch Nemesis study, those suffering from major depression, bipolar disorder, general anxiety disorder, panic disorder or substance use disorders had the highest number of sickness absence days [11]. Moreover, psychiatric comorbidity is common among patients with mental disorders. In a nationwide Finnish study, 19% of subjects with a depressive, substance use or anxiety disorder also had another of these disorders in 12 months [12]. Those with mental disorders also have an elevated risk of somatic health problems [13, 14] which is associated with increased risk of functional disability [15-17].

This study examined sickness allowance histories among those who retired due to mental disorders during the 7 years preceding disability retirement. We separately examine sickness allowance histories due to mental disorders and somatic conditions and separate six diagnostic groups of disability retirement using nationwide register data of the Finnish population.

Methods

The Finnish pension system consists of a statutory earnings-related pension scheme that accrues pension from all gainful employment and a national pension scheme that secures one's income when there are no earnings or the earnings are low [18]. The registers of the Finnish Centre for Pensions and the Social Insurance Institution of Finland were used to retrieve all those who were granted a full-time disability pension due to mental disorders from either one of these schemes in 2011 (N=6.444). Both temporary and permanent disability pensions were included. However, disability retirement due to mental retardation (ICD-10 block F70–F79) was excluded. To include only retirees who were aged 18 years at the start of the follow-up, the study population was restricted to those who were aged 25 or over at the beginning of 2011 (N=5.544).

The retirees were divided into six groups based on the primary diagnosis of the pension. The classification was based on the main blocks of the ICD-10 classification [19]. However, the block mood disorders (F30-F39) was divided into two groups, of which the first one (n=722) included mania (F30) and bipolar disorders (F31). As there was only one case with mania, this group is below called bipolar disorders. The other group included major depressive disorders (F32-F33, n=3.049). The few other mood disorders (n=62) were also included in this group. The other blocks were substance use disorders (F10-F19, n=206), schizophrenia and other psychotic disorders (F20-F29, n=903), anxiety disorders (F40-F48, n=362), and other mental disorders (n=302). For each of the disability retirees, 5 age and sex matched controls were randomly drawn from the non-retired population in the six above mentioned diagnostic groups (N=27.720).

In Finland, sickness allowance is paid to compensate for short-term work disability lasting up to one year. The data on sickness allowance from years 2004-2011 were derived from the register of the Social Insurance Institution which includes beginning and ending dates and the ICD-10 diagnoses of each sickness allowance period compensated after a waiting period of 9 working days. For those who have not been work-

ing, unemployed, studying or engaged in any other gainful activities during the preceding three months the waiting period is 55 days [20]. If work disability continues for more than one year, a disability pension can be granted [21]. Only in rare cases can disability pension be granted without the preceding sickness allowance period.

The receipt for sickness allowance was examined in one-year (365 days) intervals counting backwards from the day the disability pension began. Among the controls, sickness allowance history was traced back from the average date of disability retirement, the 19th of June 2011. We separately examined sickness allowance periods granted due to mental disorders and somatic conditions. Furthermore, using the six diagnostic groups defined above, sickness allowance periods granted due to mental disorders were divided into those based on the same or some other group than the one which eventually led to retirement.

Covariates

The covariates were derived from the end of 2010. Educational level was classified into those with primary education or no qualifications, lower-secondary, upper-secondary, and tertiary education. Occupational title was used to classify wage earners into manual workers, lower non-manual employees and upper non-manual employees following the classification of Statistics Finland [22]. If the occupation at the end of 2010 was missing, information from the previous years until 2004 was used. Self-employed were separated based on the type of their employment insurance. Marital status was classified into married, never married, divorced and widowed. Urbanization level of municipality was classified into the capital region, other large cities, towns and countryside.

Statistical analysis

We first graphically present the proportion of disability retirees who had received any sickness allowance during the 7 years preceding their disability pension. The six diagnostic groups of mental disorders were separated but, for clarity, the controls are presented as one group. Similar analysis was then conducted separating sickness allowance due to mental disorders and due to somatic conditions.

Conditional logistic regression adjusting for case-control matching [23] was used to quantify the risk of disability pension by sickness allowance status and to adjust for potential confounders. The results are presented separately for any sickness allowance, sickness allowance due to mental disorders and sickness allowance due to somatic conditions. Furthermore, sickness allowance granted due to mental disorders was categorized to the same or to some other mental disorder than the one which eventually was the primary diagnosis of the disability pension. The results are presented as odds ratios and their 95% confidence intervals for the total population and for the six diagnostic groups. As the last year before disability retirement is exceptional, we show the results for 1-2 years (366-730 days) and 6-7 years (2191-2555 days) prior to disability retirement. The effects of age and sex were controlled for by the matched design. Further confounders were adjusted for by including them as covariates in the models. All analyses were conducted using SAS 9.3.

Results

The 5.544 disability retirees had altogether 24.648 compensated sickness allowance periods during the 7 years preceding retirement. Of these periods, 35% were based on somatic conditions, 39% were due to depression, and 26% due to the other mental disorders. Among the controls (5 for each retiree), there were 33.426 sickness allowance periods, of which 85% were based on somatic conditions, 8% were due to depression, and 7% due to the other mental disorders.

Most retirees had received sickness allowance during the year preceding their disability retirement (Figure 1). This is expected since, as a rule, a one-year sickness allowance period is usually presumed before a disability pension is granted. Yet, among those who retired due to substance use disorders or "other" mental disorders, the proportion of sickness allowance recipients during the last year was only around 70%. During the previous 6 years, the proportion of sickness allowance recipients steadily increased in all six disability retiree groups. Throughout the follow-up period, the proportion was highest among those who retired due to bipolar disorders or depression. In all disability retiree groups, the proportion was clearly higher than in the control group over the whole seven-year observation period.

For sickness allowance due to mental disorders (Figure 2), the overall pattern was fairly similar than for sickness allowance due to any cause: the proportion of sickness allowance recipients steadily increased when disability retirement approached and shot up the last year before retirement. Pre-retirement receipt of sickness allowance was most common among those who retired due to bipolar disorders and lowest among those who retired because of substance use disorders. In all six diagnostic groups, receiving sickness allowance was more common than in the control group.

Receipt of sickness allowance due to somatic conditions was also common during the 7 year pre-retirement period (Figure 2). However, there was no marked increase in the proportion of sickness allowance recipients as disability pension approached. In all groups except among those who retired due to bipolar disorders or schizophrenia,

sickness allowance due to somatic conditions was more common than sickness allowance due to mental disorders. In all disability retiree groups except those who retired due to schizophrenia, sickness allowance due to somatic conditions was more common than in the control group matched for age and sex.

Table 1 presents the distribution of the study variables in the six diagnostic groups, as well as among all retirees and the control group. Slightly more than half of the disability retirees were women and they were relatively evenly distributed in the four age groups. A fourth of the retirees had a primary education and half had a lower secondary education. Nearly a third of the retirees were lower non-manual employees and another third were manual workers, but for more than one fourth a social class could not be identified as they did not have any occupational title during the observation period. Forty percent of the retirees were never married and one fourth divorced. Half of all disability retirees lived in large cities outside of the capital region. However, there were large differences in gender, age and marital status between the diagnostic groups.

Compared to the same age and sex control group, the retirees had lower education and lower social class (Table 1). The retirees were more often never married or divorced than their non-retired counterparts but there were no differences in the urbanization level of municipality.

Table 2 presents the odds ratios for disability retirement by preceding sickness allowance status comparing those with sickness allowance to those with no sickness allowance at the corresponding time points. In all diagnostic groups combined, those who had sickness allowance 1-2 years earlier had a 3.6 times higher risk for disability retirement than those with no sickness allowance. Having received sickness allowance 6-7 years earlier increased the risk for disability retirement 2.6 times. The associations were particularly strong for sickness allowance due to mental disorders: those who had received sickness allowance due to mental disorders 1-2 years earlier had 11.7 times higher risk for disability retirement than those with no sickness allowance at the corresponding time point. Having received mental sickness allowance 6-7 years earlier was associated with 6.5 times higher risk for disability retirement. However, also

sickness allowance due to somatic conditions was associated with future risk for disability retirement due to mental disorders. The risk was 1.9 times higher among those with somatic sickness allowance 1-2 years earlier and 1.6 times higher among those with somatic sickness allowance 6-7 years earlier. Controlling for educational level, social class, marital status and urbanization level of municipality, in addition to age and sex, had only a small effect.

Depression was by far the most common diagnosis for disability retirement, and the results among those who retired due to depression closely resemble those of all retirees (Table 2). Among those who retired due to bipolar disorders, any sickness allowance and sickness allowance due to mental disorders were associated with disability retirement somewhat more strongly than the average. Receiving mental sickness allowance 1-2 and 6-7 years earlier was strongly associated with disability retirement due to schizophrenia but there was no association with prior somatic sickness allowance. Prior sickness allowance due to mental disorders but also due to somatic conditions predicted disability retirement due to anxiety disorders. Instead, disability retirement due to substance use disorders and "other" mental disorders were only predicted by mental sickness allowance 1-2 and 6-7 years earlier. Adjustment for educational level, social class, marital status and urbanization level of municipality did not notably affect any of these estimates.

In Table 3, sickness allowance periods have been further divided into those granted on the basis of the same group of mental disorders which eventually led to retirement and to those granted on the basis of some other group. Overall, having received sickness allowance 1-2 and 6-7 years earlier due to the same mental disorder than the primary diagnosis of the pension was strongly associated with disability retirement. However, for many of the less frequent psychiatric diagnoses, the association could not be estimated, as there were no subjects with these diagnoses in the control group. Sickness allowance due to some other mental disorder than the one which was the primary diagnosis of the pension was also associated with disability retirement in all groups of disability retirement, most strongly among those who retired due to bipolar disorders.

Discussion

During the observation period of seven years, the proportion of sickness allowance recipients was highest among those who retired due to bipolar disorders or depressive disorders. The proportion was lowest among those who retired due to schizophrenia, substance use disorders or "other" mental disorders. In all of the diagnostic groups examined, the proportion of sickness allowance recipients gradually increased when disability retirement approached. There was no corresponding increase in the control group, suggesting that the pre-retirement increase among the disability retirees does not only reflect increased use of sickness allowance over time or advancing age of the subjects during the observation period.

The pre-retirement increase in sickness allowance was primarily due to increasing sickness allowance due to mental disorders. However, over the whole observation period, sickness allowance due to somatic conditions was nearly equally common. This may at least partly reflect the fact that sickness allowance is more commonly granted due to somatic conditions [21]. Having received sickness allowance due to mental disorders 6-7 years earlier strongly predicted disability retirement due to mental disorders, and the associations strengthened when disability pensions approached. Also sickness allowance due to somatic conditions was associated with increased risk for disability retirement but the association remained similar over time. Adjustment for social class, educational level, marital status or the urbanization level of municipality did not explain the associations.

There are marked differences in the prevalence of the different mental disorders and how often they lead to long-term work incapacity [24]. Depression has the largest implications due to its high prevalence and often recurrent nature. In our study, depressive disorders were the primary diagnoses for more than half of the disability retirees. Disability retirement due to depressive disorders was also strongly predicted by prior sickness allowance, especially due to mental reasons. Because there is a possibility of recovery based on available and appropriate treatment the development of the illness is monitored over a long time before a disability pension is granted. Only a small mi-

nority of those with depressive disorders end up with disability pension. Among Finnish municipal employees, 63% of those with depression-related absence exceeding 9 days returned work during in one year [25] and 89% returned work in 7 years [26].

Disability retirement due to bipolar disorders was most strongly predicted by prior sickness allowance. Bipolar disorders often lead to severe limitations in the ability to manage in working life. Bipolar disorders, like other severe mental disorders, are also often accompanied by alcohol related problems which may make it difficult to retain work [27]. Also schizophrenia is a severe mental disorder associated with general functional impairment. In our study the youngest retirees were 25 years old, and those with most serious illness are likely to have retired already before this age. The proportion of schizophrenia retirees who had received sickness allowance was low, in particular due to somatic conditions, but history of sickness allowance due to mental disorders was highly predictive of retirement due to schizophrenia.

In addition to the differences in the typical course of illness, variation in employment histories may affect differences between the diagnostic groups. Applying for sickness allowance may not be profitable for those who already are recipients of some other social security benefit. Some of the mental disorders typically emerge at early age and those with diagnosis assigned at an early age may never have properly integrated into the labour market. However, in our study, poor labour market attachment was not entirely related to young age. Those whose disability pension was admitted due to substance use disorder were clearly older than others but 56% of them had no information on social class due to a missing occupational title during the follow-up period. Overall, all six diagnostic groups were characterized by low social class who typically have poorer employment opportunities or prospects of return to work after illness [25]. However, sensitivity analyses showed that including only those with at least some employment history did not notably change the results.

Also sickness allowance due to other mental diagnoses than the one which eventually led to retirement strongly predicted disability pension due to mental disorders. The findings may reflect the clinical observation that the disorders develop in a gradual course and symptoms may fulfil the diagnostic criteria of different disorders at different points of time. Moreover, the data set only included information on the primary

diagnosis for disability pension. It is possible that the diagnosis considered to most restrict one's work ability when a disability pension is granted differs from the one assigned to a sickness allowance period. Sickness allowance due to other mental diagnoses most strongly predicted retirement due to bipolar disorders. Since most sickness allowance periods were granted due to depressive disorders, they had most weight in these results. Depression typically is the predominant mood polarity in bipolar disorders, and bipolar disorders may initially be diagnosed as depression and the diagnosis may be changed in later stages of the disease progression [28].

Sickness allowance due to somatic conditions predicted disability retirement but only due to depressive disorders, bipolar disorders and anxiety disorders. This may relate to co-occurrence of mental disorders and somatic health problems [13, 14]. In case of comorbidity, somatic health problems may be recognized first and if mental disorders later get worse they will eventually be rated as the primary diagnosis for disability pension. Somatic and mental sickness allowance were not determined as mutually exclusive, i.e. those with sickness allowance due to somatic conditions may also have received sickness allowance due to mental disorders during the same interval.

Strengths and limitations

The data were based on reliable register-based sources. The study population consisted of all those who had retired due to mental disorders during in 2011. To secure a 7 year follow up period for all retirees from their 18th birthday onwards, the study was restricted to those aged 25 years or older at the beginning of the year. Overall, 900 young retirees were excluded, entailing that in particular among those who retired due to schizophrenia, anxiety disorders and "other" mental disorders a large proportion of retirees were dropped out.

More than half of the study population retired due to depression as the primary diagnosis. As the diagnoses of the disability pensions are registered with only 3 digits, subtypes or severity of major depression could not be separated. In many other diagnostic categories, the number of retirees remained low and a rather crude classification had to be used.

Sickness allowance was measured dichotomously. Another possibility would have been to analyze the number of sickness allowance days. However, this would have been complicated by the skewed distribution of sickness allowance days as a large proportion of the retirees did not have any sickness allowance in a given one-year interval. As the measure was based on administrative register, in practice only sickness allowance periods longer than 2 weeks are included.

Conclusion

The proportion of sickness allowance recipients gradually increased when disability retirement due to mental disorders approached. The increase was primarily due to increase in sickness allowance due to mental disorders, but also sickness allowance due to somatic conditions was common among the retirees. Sickness allowance due to mental disorders strongly predicted disability retirement in all six disability retiree groups but also sickness allowance due to somatic conditions predicted disability retirement due to depression, bipolar disorders and anxiety disorders. As the proportion of sickness allowance recipients was high already 6-7 years before retirement, early interventions are supported. Rehabilitation among those with mental disorders has increased, but it is still rare compared to those with somatic conditions [28]. Paying early attention to recurring sickness absence may help in timely identification of persons with increased risk of retirement due to mental disorders, especially bipolar and depressive disorders.

Competing Interests

None

References

1 Smit F, Cuijpers P, Oostenbrink J, et al. Costs of nine common mental disorders: Implications for curative and preventive psychiatry. *Journal of Mental Health Policy and Economics* 2006;**9**:193-200.

2 Olesen J, Gustavsson A, Svensson M, et al. The economic cost of brain disorders in Europe. *European Journal of Neurology* 2012;**19**:155-162.

3 OECD. Sickness, Disability and Work: Breaking the Barriers. A synthesis of findings across OECD countries: OECD 2010.

4 Doyle Y, McKee M, Rechel B, et al. Meeting the challenge of population ageing. *BMJ* 2009;**339**:b3926.

5 Christensen K, Doblhammer G, Rau R, et al. Ageing populations: the challenges ahead. *The Lancet* 2009;**374**:1196-1208.

6 Lund T, Kivimäki M, Labriola M, et al. Using administrative sickness absence data as a marker of future disability pension: The prospective DREAM study of Danish private sector employees. *Occup Environ Med* 2008;**65**:28-31.

7 Labriola M, Lund T. Self-reported sickness absence as a risk marker of future disability pension. Prospective findings from the DWECS/DREAM study 1990-2004. *International Journal of Medical Sciences* 2007;**4**:153-158.

8 Kivimäki M, Ferrie JE, Hagberg J, et al. Diagnosis-specific sick leave as a risk marker for disability pension in a Swedish population. *J Epidemiol Community Health* 2007;**61**:915-920.

9 Alexanderson K, Kivimäki M, Ferrie JE, et al. Diagnosis-specific sick leave as a long-term predictor of disability pension: A 13-year follow-up of the GAZEL cohort study. *J Epidemiol Community Health* 2012;**66**:155-159.

10 Tsuang MT, Tohen M, Jones P, eds. Textbook of Psychiatric Epidemiology
 . 3rd Edition ed. Chichester, UK: Wiley 2011.

11 De Graaf R, Tuithof M, Van Dorsselaer S, et al. Comparing the effects on work performance of mental and physical disorders. *Soc Psychiatry Psychiatr Epidemiol* 2012;**47**:1873-1883.

12 Pirkola SP, Isometsä E, Suvisaari J, et al. DSM-IV mood-, anxiety- and alcohol use disorders and their comorbidity in the Finnish general population. Results from the Health 2000 Study. *Soc Psychiatry Psychiatr Epidemiol* 2005;**40**:1-10.

13 Haug TT, Mykletun A, Dahl AA. The association between anxiety, depression, and somatic symptoms in a large population: The HUNT-II study. *Psychosom Med* 2004;**66**:845-851.

14 Bair MJ, Robinson RL, Katon W, et al. Depression and Pain Comorbidity: A Literature Review. *Arch Intern Med* 2003;**163**:2433-2445.

15 Ahola K, Virtanen M, Honkonen T, et al. Common mental disorders and subsequent work disability: A population-based Health 2000 Study. *J Affect Disord* 2011;**134**:365-372.

16 Wedegaertner F, Arnhold-Kerri S, Sittaro N-, et al. Depression- and anxiety-related sick leave and the risk of permanent disability and mortality in the working population in Germany: A cohort study. *BMC Public Health* 2013;**13**.

17 Knudsen AK, Skogen JC, Harvey SB, et al. Personality disorders, common mental disorders and receipt of disability benefits: Evidence from the British national survey of psychiatric morbidity. *Psychol Med* 2012;**42**:2631-2640.

18 Barr N. The pension system in Finland: Adequacy, sustainability and system design. Helsinki: Finnish Centre for Pensions 2013.

19 World Health Organisation. ICD-10 Classifications of Mental and Behavioural Disorder: Clinical Descriptions and Diagnostic Guidelines. Geneva. World Health Organisation, 1992.

20 Kela. Statistical Yearbook of the Social Insurance Institution 2013. Official Statistics of Finland, Social Protection. Helsinki: Kela 2014.

21 Niemelä H, Salminen K. Social security in Finland. Helsinki: Social Insurance Institution, Finnish Centre for Pensions, Finnish Pension Alliance and Ministry of Social Affairs and Health 2006.

22 Statistics Finland. Sosioekonomisen aseman luokitus 1989 (Classification of socio-economic groups 1989). Handbooks 17. Helsinki: Central Statistical Office of Finland 1989.

23 Allison PD. Logistic Regression Using the SAS System: Theory and Application. Cary, NC.: SAS Institute Inc. 2001.

24 Wittchen H-, Jacobi F. Size and burden of mental disorders in Europe - A critical review and appraisal of 27 studies. *European Neuropsychopharmacology* 2005;**15**:357-376.

25 Virtanen M, Kawachi I, Oksanen T, et al. Socio-economic differences in long-term psychiatric work disability: Prospective cohort study of onset, recovery and recurrence. *Occup Environ Med* 2011;**68**:791-798.

26 Ervasti J, Vahtera J, Pentti J, et al. Return to Work After Depression-Related Absence by Employees With and Without Other Health Conditions: A Cohort Study. *Psychosomatic Medicine* 2015; ;**77**:126-35.

27 Nesvåg R, Knudsen GP, Bakken IJ, et al. Substance use disorders in schizophrenia, bipolar disorder, and depressive illness: a registry-based study. *Soc Psychiatry Psychiatr Epidemiol* 2015; **50**:1267-76.

28 Muzina DJ, Kemp DE, McIntyre RS. Differentiating bipolar disorders from major depressive disorders: Treatment implications. *Annals of Clinical Psychiatry* 2007;**19**:305-312.

29 Gould R, Härkäpää K, Järvikoski A, eds. Does vocational rehabilitation within the earnings-related pension scheme work? Studies of the Finnish Centre for Pensions 1/2012. Helsinki: Finnish Centre for Pensions, 2012.