

ORIGINAL REPORT

ALLOCATION OF REHABILITATION MEASURES PROVIDED BY THE SOCIAL INSURANCE INSTITUTION IN FINLAND: A REGISTER LINKAGE STUDY

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Objective: To study the allocation of rehabilitation measures provided by the Finnish Social Insurance Institution in relation to the characteristics and health status of rehabilitants.

Design: A register linkage study.

Subjects: A total of 67,106 full-time local government employees with a minimum of 10-month job contracts in 10 Finnish towns during the period 1994–2002.

Methods: Data on the rehabilitation granted between 1994 and 2002, special medication reimbursements for chronic diseases, and disability retirement, were derived from the registers of the Social Insurance Institution as an indicator of chronic morbidity and linked to the employers' records on demographic characteristics and rates of sickness absence.

Results: In comparison with non-rehabilitants, the rate of sickness absence (> 21 days) was 2.2–2.9-fold (95% confidence interval (CI) 2.0–3.0) higher, the odds ratios of special medication reimbursement 1.5–6.1-fold (95% CI 1.3–6.9) higher and disability retirement 3.1–7.5-fold (95% CI 2.7–9.3) higher among rehabilitants. Older women and employees in manual or lower-grade non-manual jobs predominated in the rehabilitation groups. The proportion of temporary employees receiving rehabilitation was low.

Conclusion: Permanently employed older women with an excess burden of health problems predominate in the receipt of rehabilitation provided by the Social Insurance Institution.

Key words: musculoskeletal diseases, rehabilitation, vocational rehabilitation, sick leave, disability insurance, pensions.

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INTRODUCTION

Over the past few decades, the cost of disability benefits has increased enormously in Finland and other developed countries, in parallel with the increasing mean age of the population and diminishing birth rates (1). Rehabilitation has been seen as a means to keep disabled people in employment, to prevent further impairment leading to more severe disabilities, and thereby, to reduce society's expenditure, and to enhance individuals' capacity to work and their quality of

life (2). However, little systematic information is available concerning the question of whether rehabilitation measures are optimally allocated to those groups in the workforce who have the greatest need for rehabilitation.

The word "rehabilitation" means restoration of a previously existing ability status. Hence, the term carries several meanings. As far as people of working age are concerned, the definition can be based on the objective of rehabilitation measures. In this context, vocational rehabilitation is defined as measures aiming at improving individuals' integration into the labour market (3) and medical rehabilitation as measures aiming at re-establishing and retaining physical, mental and social functions (4). The basic objective, both of medical and vocational rehabilitation, is to improve participation in working life by the disabled person whose earning capacity is reduced due to sickness, impairment or injury.

Rehabilitation by the Social Insurance Institution in Finland

In Finland, the Social Insurance Institution (SII) is the major single provider of rehabilitation for people under the age 65 years; other major providers include the national healthcare system and the labour and education administration. SII rehabilitation accounts for 20% of the society's total rehabilitation expenditure. For example, in 2004, the SII granted rehabilitation to 86,174 individuals (1.7% of the population) at a total cost of 286 million euros (5). People of working age are a special target group for SII rehabilitation; they receive approximately 80% of all the rehabilitation provided.

Rehabilitation for employees is either statutory (i.e. there is a subjective right to rehabilitation) or discretionary (i.e. there is no subjective right and the budget for discretionary rehabilitation is confirmed annually by parliament). Vocational rehabilitation is usually statutory and medical rehabilitation discretionary. Severely disabled people, who rarely participate in working life, are eligible for statutory medical rehabilitation.

The SII provides various types of vocational and medical rehabilitation for employed people (see Appendix). For example, "vocationally-oriented early medical rehabilitation" focuses on counselling towards a healthier lifestyle and a better control of occupational hazards. The rehabilitation is meant for employees under the age of 45 years who have mild symptoms but no long-lasting disabling or severe diseases.

“Vocational rehabilitation for disabled employees” is targeted at employees with an increased risk of disability that will eventually result in pensioning. In the act of the rehabilitation provided by the SII, “essential disability” is noted as a prerequisite for this rehabilitation measure. The aim is to maintain these people in employment and, in addition to such measures as new vocational plans, education and work training, it also encompasses inpatient vocational and medical rehabilitation courses, with an emphasis on counselling about work methods and self-care of symptoms. Thus, the content of these rehabilitation courses is in fact medical. Participants are expected to be elderly and to have a history of excessive sickness absences and a long-term disabling disease.

Medical rehabilitation, either in the form of courses for groups or individual inpatient rehabilitation care, is granted to employees with chronic diseases that threaten their working capacity. Most rehabilitation courses are provided for people with musculoskeletal diseases. The programs are planned to be multidisciplinary, with contributions from a physician, a psychologist, a social worker, a physiotherapist, an occupational therapist, a nurse and an exercise adviser. On the musculoskeletal rehabilitation courses, the emphasis is on active self-care and coping with pain and other symptoms. Other examples include specific courses for cancer or chronic neurological diseases. One of the aims of these courses is to improve the patients’ readjusting capacity.

Individual psychotherapy is a particular SII rehabilitation measure that is provided on an outpatient and long-lasting basis. Employees eligible for psychotherapy have a long-lasting mental health problem for which psychotherapy has been suggested by the treating psychiatrist. Preference is given to younger employees for whom the disorder may be an obstacle to participating in working life.

The implementation of rehabilitation in the above-mentioned measures is on an inpatient basis. Such an implementation requires the rehabilitant to stay in an institution for the time of the active program (typically 6–8 hours daily in 1- or 2-week periods for 2 or 3 periods over a year). The content of inpatient rehabilitation measures, both statutory and discretionary, is instructed in detail by the SII. The only exception is psychotherapy, which is not on an inpatient basis.

There are no earlier large-scale epidemiological studies in an employed cohort on the allocation of different rehabilitation measures by a main provider of rehabilitation, such as the SII in Finland. Previous studies in this field have focused on single measures, for example vocationally-oriented medical rehabilitation (6–8) or musculoskeletal medical rehabilitation courses (9–11). Population statistics on the allocation do not give accurate information on many important issues regarding rehabilitation, such as division of different measures, target groups, or equality.

The effects of rehabilitation depend on the timing of measures and the individual characteristics of rehabilitants (12, 13). This register linkage study examined, in a large cohort of full-time employees, the characteristics and health status of men and women who received different types of rehabilitation provided by the SII compared with employees not participat-

ing in SII rehabilitation. To date, this issue has not been fully addressed in the literature in spite of the huge costs to society of such rehabilitation.

METHODS

Study population

Subjects were derived from the Finnish “10 Town Study”, which is an on-going study examining the work-related determinants of health in the entire full-time staff of local government in 10 Finnish towns. The subjects’ health has been followed up from 1991 to 1994 and onwards. From this population, a group of 67,106 employees were selected who had an employment contract lasting for at least 10 months in 1994–2002. This minimum length of an employment contract was selected to avoid over-representation of short job contracts and to allow a more reliable follow-up of health and working ability of employees. For the same years (1994–2002), we extracted information on rehabilitation as well as health status, as indicated by sickness absence, special medication reimbursement for chronic diseases and disability retirement, recorded in the employers’ registers and the SII registers. The data were acquired by using personal identification numbers (a unique number that all Finns receive at birth and that is used by the social and healthcare systems).

Rehabilitation provided by the SII

We identified all employees who had participated in the 6 most common rehabilitation measures allocated by the SII: vocationally-oriented medical early rehabilitation (referred to in this article as “early rehabilitation”), vocational and medical rehabilitation for disabled employees, medical rehabilitation courses for persons with musculoskeletal diseases, medical rehabilitation courses for persons with other chronic diseases, individual inpatient medical rehabilitation, and individual outpatient psychotherapy. We also recorded the indication for rehabilitation and the time of rehabilitation. We excluded from this study medical rehabilitation for severely handicapped persons and certain types of vocational rehabilitation (such as individual examination, education and work training) due to a small number of participants allocated these measures. A total of 7,440 (11.1%) employees were granted rehabilitation in 1994–2002. Because the rehabilitation courses are typically divided into 2 or 3 phases and psychotherapy is granted for a period of up to 2 (maximum 3) years, we used the first year of rehabilitation as an indicator of the year of rehabilitation.

In Finland there are also other organizations, such as public and private healthcare and labour administration, that provide rehabilitation for the labour force. Among the population studied by us, vocational rehabilitation measures provided by the labour administration were unlikely, since the majority of the population was permanently employed. Furthermore, the role of national healthcare in rehabilitation is different from that of the SII, as the rehabilitation provided by the healthcare system is usually outpatient, short-term and aimed at resolving acute or sub-acute problems. For these reasons, participation in other providers’ rehabilitation measures was excluded from the study.

Sickness absence

Data on sickness absences and times at work in 1994–2002 were collected from the employers’ records by listing the periods of sick leave for each employee together with the dates of each sick leave. In the organizations participating in the 10-Town Study, all sick-leave certificates, irrespective of the issuer, must be forwarded for recording. For absences of up to 3 days, employees complete their own certificates. For absences longer than 3 days, medical certificates are required. The records were checked for inconsistencies, and any overlapping or consecutive periods of sickness absence were combined. The indices of sick leave used for the analysis were the annual rates of short (1–3 sick leave days), long (4–21 sick leave days) and very long (over 21 sick leave days) spells of absence.

Eligibility for special medication reimbursement

Data on eligibility for special medication reimbursement were collected from the National Prescription Register, managed by the SII. In Finland, the national sickness insurance scheme covers the entire population, regardless of age or occupational status, and provides reimbursement for almost all prescription medication. The usual reimbursement of costs for prescribed medication is slightly less than 50%. For certain chronic and severe diseases, such as hypertension, asthma and coronary heart disease, there is a special reimbursement of 75%, and for diseases such as cancer, diabetes and epilepsy, it is 100%. Fulfilment of the criteria for eligibility for special reimbursement must be proven by a certificate from a treating physician. Of the total population in Finland, more than 20% was entitled to special reimbursement at the end of 2004 (6). We used the recorded data on eligibility for special reimbursements in 1994–2002 as an indicator of chronic morbidity.

Disability retirement

Participants who were retired for any reason by 31 December 2004 were identified from a register kept by the SII and the Finnish Centre for Pensions. This register provides complete retirement data starting from 2002 for the entire population. We collected data on the cause of retirement, and distinguished the participants who had retired due to disability from those who had retired due to non-medical reasons.

Demographic variables

The following demographic data were collected from the employers' records: gender, age, occupational title (higher grade non-manual, lower grade non-manual or manual worker), duration and type of employment contract (permanent or temporary). The highest occupational status during the follow-up time was taken as the occupational status. The type of employment contract was marked as permanent, if there was any single period of permanent contract during the follow-up period.

Statistical analysis

The χ^2 -test was used to compare the demographic characteristics of the employees receiving rehabilitation against those of all other employees. Comparison of age groups was done on the basis of the situation in the year 1999. Sickness absence is a rare event and constitutes count data, wherefore the distribution of this discrete variable was modelled with a Poisson distribution (in the analysis). The use of a Poisson model implies that the between-employee variance in the sick absence rates equals the expected rate. Because the dispersion of absences differed somewhat from that predicted by the Poisson model, we used the square root of

the deviance divided by degrees of freedom to adjust for standard errors. We expressed the results as rate ratios (RR) and their 95% confidence intervals (95% CI). To compare the rates of special medication reimbursements and disability pensions between those employees receiving rehabilitation and those not receiving rehabilitation, we counted odds ratios (OR) and their 95% CI with logistic regression models. Adjustments were made in the models for demographic variables (gender, age, occupational status and type of employment contract). The SAS V9.1 statistical package was used for all analyses.

RESULTS

Table I shows the associations between the demographic variables and the health indicators. Although women had 1.3–1.6 times higher rates of sickness absence than men, no gender difference was found in the odds of being granted special reimbursement to medication of chronic diseases or disability pension. Higher age and lower occupational status were associated with a higher risk of long-term sickness absences, special reimbursement and disability pension. Temporary employment was associated with lower rates of long-term absences, and no difference in disability pension was observed despite higher odds of severe or longstanding diseases, as indicated by eligibility for special reimbursement.

The annual incidence of rehabilitation (allocation) was 1.6% on average. Early rehabilitation was the most frequent measure (3.6% of the cohort), followed by vocational and medical rehabilitation for disabled employees (1.9%), medical rehabilitation courses for musculoskeletal diseases (1.9%) and medical rehabilitation and readjustment courses for other chronic diseases (1.9%). Individual inpatient medical rehabilitation and outpatient psychotherapy were less frequent.

The most common indications for rehabilitation were musculoskeletal diagnoses (62% of all indications), mental health diagnoses (16%), cardiovascular diagnoses (3%) and neurological diagnoses (3%).

Table II shows the demographic characteristics for the entire cohort and for the rehabilitants. Of the entire cohort,

Table I. Independent associations of demographic variables with sickness absence, special reimbursement and early disability.

	<i>n</i>	Sickness absence			Special reimbursement OR (95% CI)	Disability pension OR (95% CI)
		1–3 days RR (95% CI)	4–21 days RR (95% CI)	> 21 days RR (95% CI)		
Gender						
Men	18273	1.00	1.00	1.00	1.00	1.00
Women	48833	1.59 (1.56–1.62)	1.47 (1.44–1.50)	1.34 (1.30–1.38)	1.00 (0.95–1.04)	1.00 (0.92–1.08)
Age (10-year strata)	67106	0.79 (0.78–0.79)	0.97 (0.96–0.98)	1.35 (1.33–1.36)	1.90 (1.86–1.94)	6.09 (5.52–6.52)
Occupational status						
Higher grade non-manual	24653	1.00	1.00	1.00	1.00	1.00
Lower grade non-manual	28338	1.26 (1.24–1.28)	1.57 (1.54–1.60)	1.66 (1.61–1.71)	1.34 (1.29–1.40)	1.93 (1.75–2.12)
Manual	13950	1.26 (1.24–1.29)	2.17 (2.12–2.22)	2.35 (2.28–2.43)	1.46 (1.38–1.53)	3.23 (2.92–3.57)
Type of employment contract						
Permanent	57668	1.00	1.00	1.00	1.00	1.00
Temporary	9438	1.02 (0.99–1.04)	0.93 (0.91–0.96)	0.71 (0.67–0.75)	1.10 (1.03–1.17)	0.95 (0.83–1.09)

RR: rate ratio; OR: odds ratio; CI: confidence interval.

Table II. Characteristics of the study cohort and the Social Insurance Institution rehabilitation participants.

	Employees participating in rehabilitation						
	All employees (n = 67106)	Early rehabilitation (n = 2409)	Vocational and medical rehabilitation (n = 1266)	Musculoskeletal rehabilitation courses (n = 1251)	Other chronic disease rehabilitation courses (n = 1272)	Individual inpatient rehabilitation (n = 898)	Psycho- therapy (n = 924)
Gender, n (%)							
Men	18273 (27)	617 (26)	257 (22)	248 (20)	287 (23)	210 (23)	139 (15)
Women	48833 (73)	1792 (74)	1009 (78)	1003 (80)	985 (77)	688 (77)	785 (85)
Age (years)							
Mean (SD) in 1999	44.4 (10.4)	47.8 (5.8)	52.8 (5.2)	51.2 (6.9)	49.0 (8.2)	52.3 (6.9)	40.7 (8.1)
Median at rehabilitation		47.3	52.8	50.2	48.3	51.0	39.3
Occupational status*, n (%)							
Higher grade non-manual	24653 (37)	844 (35)	340 (27)	275 (22)	348 (28)	203 (23)	537 (58)
Lower grade non-manual	28338 (42)	932 (39)	516 (41)	580 (46)	623 (49)	391 (43)	338 (37)
Manual	13950 (21)	632 (26)	408 (32)	395 (32)	294 (23)	303 (34)	46 (5)
Type of employment contract**, n (%)							
Permanent	57668 (86)	2370 (98)	1257 (99)	1218 (97)	1176 (92)	855 (95)	722 (78)
Temporary	9438 (14)	39 (2)	9 (1)	33 (3)	96 (8)	43 (5)	202 (22)

All difference between the rehabilitation groups and the eligible population are significant ($p \geq 0.001$) except for gender in early rehabilitation ($p = 0.069$) and in individual inpatient rehabilitation ($p = 0.009$).

*Occupational status is the highest found during the years 1994–2002. **Type of employment contract is permanent if that was ever stated during the follow-up.

74% were women, 79% were in non-manual occupations, and 86% had a permanent contract. The mean age was 44 years. Compared with non-rehabilitants, rehabilitants were more often permanently employed women of older age and less often from higher-grade non-manual occupations. An exception was psychotherapy, which was mainly granted to young employees, of whom only 15% were men and 5% were manual workers. Psychotherapy was the only type of rehabilitation in which

the proportion of temporary employees (22%) exceeded that of the entire cohort (14%). In all other types of rehabilitation the proportion of temporary employees was lower (1–8%).

Table III displays the rates of short (1–3 days), long (4–21 days) and very long (> 21 days) sickness absences per person-year and the corresponding rate ratios adjusted for demographic variables. Employees receiving rehabilitation had more sick leave in every rehabilitation measure group compared with

Table III. Associations of sickness absence rates (spells per 1 person-year) with the participation in the Social Insurance Institution rehabilitation. Rate ratios (RR) (95% confidence interval (CI)) adjusted for gender, age, occupational status and the type of employment contract.

	n	Duration of sickness absence					
		1–3 days		4–21 days		> 21 days	
		Absence rate	RR (95% CI)	Absence rate	RR (95% CI)	Absence rate	RR (95% CI)
Early rehabilitation							
No	64697	1.39	1.00	0.66	1.00	0.15	1.00
Yes	2409	1.44	1.11 (1.08–1.15)	0.78	1.15 (1.11–1.19)	0.18	1.08 (1.02–1.13)
Vocational and medical rehabilitation							
No	65840	1.39	1.00	0.65	1.00	0.15	1.00
Yes	1266	1.54	1.28 (1.23–1.34)	1.29	1.85 (1.78–1.92)	0.42	2.11 (2.01–2.21)
Musculoskeletal rehabilitation courses							
No	65855	1.39	1.00	0.65	1.00	0.15	1.00
Yes	1251	1.67	1.31 (1.26–1.37)	1.37	1.91 (1.83–1.98)	0.43	2.17 (2.07–2.28)
Other chronic disease rehabilitation courses							
No	65834	1.39	1.00	0.66	1.00	0.15	1.00
Yes	1272	1.78	1.36 (1.30–1.42)	1.25	1.82 (1.74–1.89)	0.47	2.69 (2.56–2.81)
Individual inpatient rehabilitation							
No	66208	1.39	1.00	0.66	1.00	0.15	1.00
Yes	898	1.61	1.31 (1.24–1.38)	1.46	2.05 (1.96–2.15)	0.57	2.87 (2.73–3.02)
Psychotherapy							
No	66182	1.39	1.00	0.66	1.00	0.15	1.00
Yes	924	1.96	1.32 (1.26–1.39)	0.87	1.47 (1.39–1.57)	0.32	2.84 (2.65–3.04)

non-rehabilitants; the corresponding RR were 2.1–2.9 for very long absences, 1.5–2.1 for long absences and 1.3–1.4 for short absences. The only exception was early rehabilitation where the absence rate of the rehabilitants was not elevated.

Table IV shows the proportion of special reimbursements granted for severe and chronic conditions among rehabilitants and non-rehabilitants. On average, more than 20% of all employees received special reimbursement for some chronic disease. Compared with non-rehabilitants, the odds of special reimbursements were 1.5–6.1 times higher (95% CI 1.3–6.9) for rehabilitants. The odds were highest for those allocated medical rehabilitation courses due to chronic diseases. The only exception was early rehabilitation, which showed no association with special reimbursement.

Table IV also shows the proportions of disability pensions among the employees receiving rehabilitation at the end of 2004. A total of 13,055 (19%) employees were retired by that time, 9458 (72%) due to old age or some other non-health related cause and 3597 (28%) due to work disability. The odds of disability pensions were 3.1–7.5 times higher among rehabilitants, with one exception; the odds of disability retirement were 34% lower for those receiving early rehabilitation in comparison with those with no early rehabilitation. However, when the employees not eligible for early rehabilitation, i.e. the 4166 employees granted rehabilitation due to long-term disabling or severe diseases, were excluded from the reference group, the odds were at the same level (OR 0.87, 95% CI 0.70–1.07).

DISCUSSION

The overall annual rate of rehabilitation granted by the SII was 1.6% in a large cohort of full-time employees. Rehabilitants had increased rates of severe health problems, as indicated by the high sickness absence rates and the high odds for special medication reimbursement and disability retirement.

In our study, elderly women in permanent manual or permanent lower-grade non-manual jobs received a major proportion of all rehabilitation granted by the SII. However, their probability of having severe health problems, as indicated by special reimbursement for severe and chronic diseases, did not differ from that in men. The predominance of women in rehabilitation is in accordance with the overall statistics on the rehabilitation provided by the SII. The statistics show that 55% of all rehabilitation is granted to women. Although the nature of this gender-related difference in rehabilitation allocation is not fully understood (14), it may stem from the higher prevalence of symptoms, such as pain, musculoskeletal or psychiatric symptoms (15–17), a lower threshold for seeking medical help, or a better motivation for rehabilitation (18) among women. High alcohol consumption among Finnish men (19), which is a reason for not being eligible for rehabilitation, may also explain the gender difference to some extent.

The gender difference was at its highest in psychotherapy: only 15% of the psychotherapy rehabilitants were men, while the proportion of men in the cohort was 27%. This is in sharp contrast with the fact that the proportion of male employees granted disability pension due to psychiatric disorders exceeds the proportion of men in public sector employment. In 2003, for example, 30% of all public sector employees were men, while 38% of those retired due to psychiatric disorders were men (20).

An important finding is that employees with a temporary employment contract were rarely granted rehabilitation in spite of their higher burden of severe and chronic medical conditions and a similar risk of disability pension in comparison with permanent employees in this study, and increased mortality reported earlier (21). This finding may be due to several reasons. Occupational healthcare plays an important role in seeking and recommending rehabilitation. However, temporary employees may not be fully covered by occupa-

Table IV. Associations of the granted special medical reimbursement and disability pensions with the participation in the Social Insurance Institution rehabilitation. Odds ratios (OR) (95% confidence interval (CI)) adjusted for gender, age, occupational status and type of employment contract.

	n	Special medication reimbursement		Disability pension	
		n (%)	OR (95% CI)	n (%)	OR (95% CI)
Early rehabilitation					
No	64697	14,772 (23)	1.00	3457 (6)	1.00
Yes	2409	607 (25)	0.99 (0.90–1.09)	140 (6)	0.66 (0.55–0.80)
Vocational and medical rehabilitation					
No	65840	14,829 (23)	1.00	3277 (6)	1.00
Yes	1266	550 (43)	1.68 (1.49–1.88)	320 (32)	3.11 (2.68–3.61)
Musculoskeletal rehabilitation courses					
No	65855	14,897 (23)	1.00	3308 (6)	1.00
Yes	1251	482 (39)	1.46 (1.29–1.64)	289 (29)	3.33 (2.85–3.88)
Other chronic disease rehabilitation courses					
No	65834	14,529 (22)	1.00	3231 (6)	1.00
Yes	1272	850 (67)	6.12 (5.42–6.92)	366 (34)	6.41 (5.53–7.44)
Individual inpatient rehabilitation					
No	66208	14,942 (23)	1.00	3282 (6)	1.00
Yes	898	437 (49)	2.09 (1.83–2.40)	315 (46)	7.01 (5.90–8.34)
Psychotherapy					
No	66182	15,140 (23)	1.00	3457 (6)	1.00
Yes	924	239 (26)	1.71 (1.47–2.00)	140 (15)	7.54 (6.11–9.31)

tional health services. Also, permanent employment and a convincing work career are required for the most common rehabilitation measures, such as early rehabilitation and vocational and medical rehabilitation for disabled employees. Furthermore, except for psychotherapy, which was the only rehabilitation measure equally received by temporary employees, all of the rehabilitation measures provided by the SII are implemented on an inpatient basis, requiring absence from work during the rehabilitation period. This may heighten the threshold for temporary employees to seek rehabilitation, as job insecurity is higher in this group than among employees with permanent posts (22). It has been suggested that high job insecurity increases the likelihood of attending work while ill (23, 24). Temporary employees with an elevated risk of health impairment had a need for corresponding rehabilitation, but they were under-represented in the allocation of rehabilitation measures. Thus, our findings indicate a potential inequality in the rehabilitation granted by the SII.

Although the spectrum of rehabilitation indications has changed over time, musculoskeletal diseases have, during the past decades, been the leading indication for rehabilitation among 30–64-year-old Finnish people (25, 26). However, while 20 years ago cardiovascular diseases were the second highest cause of limitation of working capacity (27), in our study the proportion of cardiovascular diagnoses was only 3% of the rehabilitation indications.

The rehabilitants showed increased rates of severe health problems. Their sickness absence rates and OR for special medication reimbursement and disability retirement were elevated in 5 out of 6 rehabilitation measures. Based on these data, it is not clear to what extent our findings reflect appropriate allocation of rehabilitation measures and to what extent they reflect non-optimal effectiveness of rehabilitation on work ability. The SII rehabilitation measures differ from each other for their indications and eligibility criteria. For most of the measures, increased work disability due to chronic diseases is a prerequisite for rehabilitation. Early rehabilitation is the only exception to this, as it is preventive in nature, aiming at a healthier lifestyle and better ability to control future health-related problems in the person's working life, and severe disability is an excluding factor. These rehabilitants are free from long-lasting disabling or severe diseases, and hence, for early rehabilitation to be effective, one would expect to find a decreased risk of disability pension among rehabilitants. This was not the case in this study, where the risk of being on a disability pension was not lower for those allocated early rehabilitation than for those not allocated rehabilitation.

A strength of our study lies in the reliability of information from the employers' registers and national registers, which makes it unlikely that our data on rehabilitation, health and health-related measures would be biased. Obviously, some of the sick leave represents voluntary absenteeism not related to any physical or mental illness, and some employees work while ill and record no absences (28). Thus, to a certain extent, sickness absence is a subjective assessment of health, despite the objective data collection. However, this subjective component

is an unlikely source of major bias. Long spells of sickness absence have been found to be a more powerful predictor of all-cause mortality than established self-reported health measures and available objective measures of specific physical illnesses and medical conditions (23). Long sickness absences are also found to be a strong predictor of specific causes of death, such as cardiovascular disease, cancer, alcohol-related causes and suicide (29), and a risk marker for future disability retirement (30). The eligibility for a special medication reimbursement is strongly associated with morbidity (31), as is the eligibility for disability retirement (32).

The results of this large-scale register linkage study probably accurately characterize the distribution of inpatient vocational and medical rehabilitation among the working population in Finland. Such rehabilitation is extremely costly. This leads to a strong demand for evaluation of the effectiveness of rehabilitation; a topic we will focus on in future studies. Our findings suggest that a major proportion of rehabilitation measures provided by the SII for working age people in Finland is allocated to permanently employed older women with an excess burden of health problems. Temporary employees may be under-represented in the allocation of rehabilitation and, with regard to psychotherapy; this may also be the case for manual employees.

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APPENDIX

Schematic grouping of the Social Insurance Institution (SII) rehabilitation measures.

Vocational rehabilitation	Medical rehabilitation
Vocational and medical rehabilitation for disabled employees	Medical rehabilitation and readjustment courses for chronic diseases
– essential disability	– musculoskeletal diseases
– inpatient	– other chronic diseases
– statutory	– disability varies
Vocationally oriented medical rehabilitation	– inpatient
– early rehabilitation for employees	– discretionary
– inpatient	Individual institutional medical rehabilitation
– discretionary	– chronic diseases (mostly musculoskeletal)
Vocational rehabilitation examination, education and work training (not included in this study)	– disability varies
– essential disability	– inpatient
– outpatient or inpatient	– discretionary
– statutory	Psychotherapy
	– long-term disorder
	– outpatient
	– discretionary
	Medical rehabilitation for severely disabled persons (not included in this study)
	– from childhood to the age of 65 years
	– outpatient or inpatient
	– statutory

Medical (and part of vocational) rehabilitation is implemented in groups and is often divided into 2 or 3 phases lasting from 1 to 2 weeks in a rehabilitation institution. If active participation in groups is assumed to be difficult or impossible, individual inpatient medical rehabilitation may be granted. Psychotherapy is usually individual. The regimes of courses and individual care are planned so as to activate the participants, putting emphasis on knowledge about disorders, reassurance and self-care. Statutory rehabilitation is entitled by a subjective right. Discretionary rehabilitation is granted after judgement of the SII authorities and is based on the annual budget confirmed by parliament.