Short communication

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Role of diagnoses and socioeconomic status in mortality among disability pensioners in Norway—a population-based cohort study

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Objectives Several studies have shown increased mortality among disability pensioners. This study attempted to determine the causes of such an increase.

Methods A population-based study was carried out with 148 942 persons followed between 1990 and 1996 in Norway. There were 6285 women, of whom 4113 were on a disability pension at baseline. A Cox proportional hazards analysis was carried out separately for the women and men in which all-cause mortality was the outcome variable. Disability pension status, disability pension diagnosis, age, educational level, and mean annual income were entered as explanatory variables.

Results Persons on a disability pension had a strongly increased mortality rate. The age-adjusted hazard ratio was 3.0 [95% confidence interval (95% CI) 2.4–3.8] for the women and 3.4 (95% CI 2.8–4.1) for the men on a disability pension, when they were compared with those not on a disability pension. When adjusted for education and income levels, the hazard ratios (HR) decreased significantly for the men, to 2.0 (95% CI 1.8–2.4), but not so for women (HR 2.5, 95% CI 2.2–2.9). Except for the men with musculoskeletal diagnoses, all of the diagnostic groups had hazard ratios above unity also after the adjustments were made.

Conclusions The study confirmed high early mortality among Norwegian disability pensioners in the period 1990–1996. The medical condition seemed to contribute more to the increased mortality among the women, whereas a low socioeconomic status was more important for the men.

Key terms medical condition.

Especially in countries with universal access to social insurance, an increasing part of the working population has been granted permanent social insurance benefits on medical grounds, referred to in this report as "disability pension" (1), but the role of ill health has been questioned. For instance, economists and others have used the concept of moral hazard and the label "camouflaged unemployment" (2). However, studies with different samples and designs, using data from the 1970s, 1980s, and 1990s, have indicated an increased mortality among disability pensioners (3–7), and increased mortality is a strong indication of poor health. The most recent studies, from Sweden, found a three times higher age-standardized mortality for persons on a disability pension (6, 7).

Such elevated mortality could be caused by the disease motivating the disability pension or by risk factors of the disease, such as adverse workplace factors (8, 9), smoking (10), or obesity (11). However, most disability pensions are due to musculoskeletal or common psychiatric disorders (ie, conditions that rarely cause death). Low self-rated health (12, 13) and low socioeconomic status (14–16) are also risk factors for disability pensioning and for early death (17). Low socioeconomic status and factors linked to a low socioeconomic status may thus also explain the increased mortality among disability pensioners. The consequences of being on disability pension, like marginalization from the labor market and other social arenas, may also contribute (18, 19).

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A weakness of previous studies has been a lack of information on the diagnosis or medical cause on which the disability pension was based. The aim of this study was to investigate mortality among groups of Norwegian disability pensioners with different disability pension diagnoses while adjusting for socioeconomic status.

Study population and methods

A historical, population-based cohort study using a 10% random sample of all legal residents of Norway (the KIRUT database: the database of client streams around and into the social insurance system, a 10% sample of the Norwegian adult population) was conducted. The KIRUT database has been described earlier (20). The study sample included 148 942 persons (49% women) who, on 1 January 1990, were aged 30–59 years and had valid baseline data on educational level and mean annual income (meaning "G"). "G" signifies pension credits, an indexed measure that, in 2006, was NOK 62 800 (approximately EUR 7850). Other independent variables were disability pension status at baseline and the diagnosis motivating the disability pension (ie, musculoskeletal, mental (three subgroups), cardiovascular, respiratory, cancer, and all-others categories).

Cox's proportional hazards analysis was used with (time to) death as the dependent variable, stratified by gender. First, the effect of the disability pension status was estimated with adjustment only for age. Second, the effect of the disability pension diagnosis was estimated after adjustment for age. Cases without a disability pension formed the reference group. Finally, the socioeconomic status indicators (educational level and mean income) were included in the first two models. The cases were excluded at the time of emigration, and the follow-up ended on 31 December 1996.

Results

Table 1 shows the distribution of the disability pension diagnoses at baseline and the number of deaths in each group. The socioeconomic variables were distributed very differently among the cases with and without a disability pension at baseline. Among the disability pensioners, 55% had only a basic education, compared with 25% of those not on a disability pension. The mean income was even more unequally distributed (data not shown in the table).

Table 1 shows the results of the Cox' regression analysis. The age-standardized hazard ratio (HR) for disability pension status was 3.0 [95% confidence interval (95% CI) 2.4–3.8] for the women and 3.4 (95% CI 2.8–4.1) for the men when the group of persons not on a disability pension was used as the reference. For the men, the hazard ratio for "all disability pensions" fell significantly from 3.4 (95% CI 2.8–4.1) to 2.0 (1.8–2.4) in the final model, which included the indicators of socioeconomic status. Adjustment for socioeconomic status had a significant effect in all of the diagnostic subgroups except "respiratory" and "cancer" diagnoses. Among the women, there was no similar effect. The hazard ratio for "all disability pensions" was 3.0 (95% CI

Table 1. Mortality among men and women aged 30–59 years in Norway at the baseline in relation to disability pension status in 1990–1996—hazard ratios for death with the 95% confidence intervals (95% CI) according to disability pension status and disability pension diagnosis, adjusted for age (model 1) and for age, educational level, and mean income before inclusion (model 2).

Variable	Women (N=73 420)						Men (N=75 500)					
	N	Deaths	Model 1		Model 2		N	Deaths	Model 1		Model 2	
			Hazard ratio [a]	95% CI	Hazard ratio [b]	95% CI			Hazard ratio [a]	95% CI	Hazard ratio [b]	95% CI
No disability pension (reference)	66862	810	1.0	..	1.0	..	71409	1585	1.0	..	1.0	..
All disability pensions	6585	374	3.0	2.4–3.8	2.5	2.2–2.9	4113	551	3.4	2.8–4.1	2.0	1.8–2.4
Musculoskeletal	2488	84	1.6	1.3–2.1	1.4	1.1–1.8	897	78	2.1	1.7–2.7	1.2	0.9–1.5
All mental	1695	95	3.1	2.5–3.9	2.6	2.1–3.3	1351	199	4.8	4.1–5.6	2.5	2.1–3.0
Neuroses	1303	65	2.7	2.1–3.5	2.3	1.7–3.0	679	70	3.1	2.4–3.9	1.7	1.3–2.2
Psychoses	345	22	3.9	2.5–5.9	3.2	2.1–4.9	409	71	6.0	4.7–7.6	3.1	2.4–4.0
Alcohol, substance	47	8	12.6	6.3–25.3	9.9	4.9–20.0	263	58	8.1	6.2–10.5	4.1	3.0–5.4
Neurological	384	32	5.4	3.8–7.7	4.5	3.1–6.5	257	47	6.5	4.8–8.7	3.5	2.5–4.7
Cardiovascular	294	41	6.5	4.7–8.9	5.4	3.9–7.5	419	72	3.9	3.1–5.0	2.2	1.7–2.9
Respiratory	175	16	4.7	2.8–7.7	4.0	2.4–6.6	124	27	5.6	3.8–8.3	3.1	2.1–4.6
Cancer	125	31	14.1	9.9–20.3	12.0	8.3–17.3	48	15	10.4	6.3–14.5	5.9	3.5–9.9
All others	1424	75	3.0	2.4 –3.8	2.5	1.9–3.2	1017	113	3.4	2.8–4.1	1.8	1.5–2.3

[a] Adjusted for age.
[b] Adjusted for age, education, and mean income.

2.4–3.8) before and 2.5 (95% CI 2.2–2.9) after adjustment for socioeconomic status. Similar nonsignificant results were found for all of the female subgroups.

Among the men, the hazard ratios were nearly halved when adjusted for socioeconomic status, except for the "cancer" and "respiratory" diagnoses. Among the men, the cases with a musculoskeletal diagnosis had an increased mortality in the first model (HR 2.1, 95% CI 1.7–2.7). However, when adjusted for the socioeconomic status indicators, the mortality was no longer elevated in the comparison with those not on a disability pension (HR 1.2, 95% CI 0.9–1.5). All of the other diagnostic groups had hazard ratios above unity for both genders in the full model.

For the women, the hazard ratio for the "all mental" diagnosis was 2.6 (95% CI 2.1–3.3) in the full model. This ratio was significantly higher than for the musculoskeletal group, which had a hazard ratio of 1.4 (95% CI 1.1–1.8). For both genders, the persons diagnosed with alcohol and substance use disorders had a very high mortality rate, second only to cases with cancer. The hazard ratio for the men with cardiovascular diagnoses was 2.2 (1.7–2.9), a value significantly lower than that of the respective female group (HR 5.4, 95% 3.9–7.5).

Discussion

In conclusion, the study verified recent studies from Sweden (6, 7) in that the disability pension recipients aged 30–59 years had a threefold increased mortality during the 7 years of follow-up when compared with the sector of the population of the same age and gender and not on a disability pension. The only group that did not have an elevated mortality comprised men with musculoskeletal disabilities.

Adjustments for the indicators of socioeconomic status revealed important gender differences. The drop in the hazard ratios among the men was statistically significant, contrary to the findings for all of the female groups on a disability pension. This finding indicates a greater role of socioeconomic differences among the men, and the medical condition may be more decisive for women with a disability pension. For instance, cancer is a more common diagnosis for a disability pension among women. In addition, because many Norwegian women work part-time, income is a less valuable indicator of socioeconomic status for women.

The mortality among those with a disability pension based on a psychiatric diagnosis (largely explained by psychoses and substance use cases) was higher than for those with musculoskeletal disorders among both the women and the men. This finding is important because of the possible diagnostic shift towards more psychiatric diagnoses in social insurance (21–23). Socioeconomic inequalities had less effect among the women. There is an ongoing discussion regarding which aspects of socioeconomic status have the greatest impact on mortality, education, income inequalities, and labor market position (24). Different aspects of socioeconomic status may also predict mortality differently according to causes of death (17, 25). In our present study of all-cause mortality, a low level of education had an almost identical effect on mortality among the women and men. Income also had a strong and linear effect on mortality among the men, but not among the women.

The strengths of the study were the population-based prospective design, the large sample size in comparison with that of previous studies, high data quality, and lack of dropouts.

Since the mortality pattern of the middle-aged population has changed over recent decades, the results are not necessarily valid for the most recent period, or for the period before 1990. However, we are not aware of similar studies using mortality data for the latest decade, and such data were not available when we planned our study. Since the population not on a disability pension was used for reference, the hazard ratios for each diagnostic group may have been overestimated. The use of mean income, based on the mean number of "G" or pension credits, may be misleading for the women, who in Norway often work part-time, at least in some periods. Family income may be an alternative, even though this measurement also has problems (26). Data on social class, for instance, manual versus nonmanual occupations, and workplace factors were not available in the KIRUT database.

In addition to disability pension diagnosis and socioeconomic status, health and lifestyle factors related to disability pension status were the most likely confounders. Smoking, a known risk factor for disability pensioning and early death (10), poor diet (11), psychosocial distress (27), social marginalization (18), and reduced coping skills may have been causal factors.

Further studies of the possible causal factors behind the high mortality of persons on a disability pension should be carried out and should include health and lifestyle data, like smoking habits and diet, as possible explanatory factors. The studies should also include data from the last decade and data on causes of death. Actions aimed at improving the health and material conditions of disability pensioners should be considered as a part of the struggle against socioeconomic disparities in health.

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