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## Perceived health as a predictor of early retirement

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**Objectives** This study examined the association between perceived health and early retirement.

**Methods** A cohort of 1748 men aged 42 to 60 years from eastern Finland was followed from 1984 to 2000. At baseline, the participants had answered a questionnaire regarding their general (as measured by physician diagnoses) and perceived health status. Comprehensive pension records were obtained from the Social Insurance Institution of Finland and the Central Pension Security Institute. The risk of disability pensioning in various disease categories and nonillness-based early pensioning was analyzed using Cox regression modeling.

**Results** Over 11 years, 855 (48.9%) men received a disability pension, and 331 (18.9%) received a nonillness-based early pension. Only 273 (15.6%) received an old age pension, without previous early pensioning. At the end of the follow-up, 289 (16.5%) were still working. After adjustment for potential confounders, men with poor perceived health at baseline had a relative risk of 2.37 [95% confidence interval (95% CI) 1.79–3.13] for disability pensioning and the highest risk of disability was due to mental illness (RR 3.84, 95% CI 1.86–7.92), followed by musculoskeletal disorders and cardiovascular diseases. The relative risk of receiving a nonillness-based pension was 2.94 (95% CI 1.92–4.50) for this group.

**Conclusions** Self-assessed poor health is a strong predictor of early retirement due to mental disorders, musculoskeletal disorders, and cardiovascular diseases. Moreover, the risk of retirement on a nonillness-based pension is increased among those with poor perceived health.

**Key terms** disability, early pension, longitudinal study, prospective population-based study, self-assessed health.

Subjectively perceived poor health and poor coping at work are important reasons for many workers to apply for a disability pension. However, the granting of a disability pension should be based on an objectively determined decrease in functional and work capacity due to illness. In Finland, this objective assessment is made by an attending physician. Since willingness to retire early is rather high in many western countries, a physician often confronts a discrepancy between objective and subjective estimates of work ability.

Perceived poor health and its association with disability and other related risk factors are poorly understood. However, it has been observed that disability is often due to perceived poor health rather than to objectively diagnosed illness (1). In a Finnish 4-year follow-up study, a low work ability index predicted disability (2). This work ability index was based on knowledge of chronic illnesses and perceived work ability. In another study, the strongest risk factors for perceived poor health were the number of diagnosed illnesses, smoking, physical workload, and insecurity about own life satisfaction

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(3). The predictors of better self-assessed health were satisfaction in life, enthusiasm over own hobbies, and physical exercise. A longitudinal study from the United States showed that the risk of labor market exit in the context of perceived ill health depended on gender, race, and education (4). A Finnish study reported that, of the 47-year-olds, 54% perceived their health as impaired, even without any diagnosed illness, but, among the 58-year-olds, only 24% of the “healthy” people perceived their health as impaired (1). This discrepancy was explained as due to the older people valuing the lack of diseases instead of lack of symptoms.

It has been shown earlier that poor perceived health is associated with an increased risk of disability pension (5, 6), but an association of perceived health with disability pensions in different disease categories has not been reported earlier. Because perceived poor health is associated with early exit from the labor market, we need to understand it better in order to control early retirement. We studied the association between perceived health, related risk factors, and the risk of early retirement in a longitudinal population-based study. Our specific aim was to investigate the association between perceived health and the risk of early retirement due to different diseases.

## Methods

### Participants

The Kuopio Ischaemic Heart Disease Risk Factor Study (KIHD) is a population study primarily investigating unestablished risk factors for ischemic heart disease and carotid atherosclerosis (5). The participants of this study are four age cohorts of middle-aged men living in the city of Kuopio or in near rural communities in eastern Finland. The total number of men included in the study is 2682 (participation rate 82.9%), and these men were first examined in 1984 when they were aged 42-, 48-, 54- or 60 years. In this study, the men who had retired before the baseline survey (N=898) or died during the follow-up (N=29) or did not answer the questions concerning perceived health (N=7) were excluded. Thus the final study population included 1748 men, who were either full-time (N=1602) or part-time (N=30) workers, unemployed men (N=99), or men laid-off from work (N=17).

### Assessment of perceived health

At the baseline, an extensive questionnaire was administered, including questions on perceived health. The first question was How is your present health? The alternatives were 0 = very good, 1 = pretty good, 2 = average, 3 = pretty poor, 4 = very poor. The second question asked the person to compare his own health with that of other men

of the same age using “When you compare your health to that of the other men of your age, do you consider yourself to be 0 = much healthier than others, 1 = a little healthier than others, 2 = just as healthy as others, 3 = a little less healthy than others, or 4 = much less healthy than others?” For the analyses, the variables in both questions were categorized into three classes in which alternatives 0 and 1 were combined (good–better than of other men of the same age), alternative 2 remained (average or the same as that of other men of same age), and alternatives 3 and 4 were combined (poor–worse than that of other men of the same age).

### Assessment of early retirement

The cohort was linked to the pension registers of the Social Insurance Institution of Finland and the Central Pension Security Institute, covering all pensions of these men until 31 May 2000. The Social Insurance Institution of Finland is responsible for the basic social security provision of every Finnish citizen from the age of 16 up to 65 years with respect to disability. The Central Pension Security Institute is the statutory central body of the pension institutions in the private sector.

When a person becomes ill and the illness causes disability, the first step is to claim a sickness allowance. The disability pension is applied if the disability continues over 300 workdays. The individual early retirement pension is another type of disability pension program that requires disability due to some chronic disease, a minimum age of 56 years, and a long work history. In this study, the term disability pension includes both regular disability pensions and the individual early retirement pensions. The first diagnosis of an attending physician as listed in the pension certificate is regarded as the main cause of disability.

In Finland, there are also many different nonillness-based early pensions. Through these retirement programs, it is possible to retire without disability before the normal age of retirement (65 years). An unemployment pension requires the age of 60 years and an unemployment period of at least 500 days. For farmers aged 55 to 64 years, there are two different pensions in which disability is not required: pension awarded after a person gives up farming and pension after the transfer of a farm to a descendant. With the permission of an employer, a part-time pension can be granted for workers aged 56 years and over. In this study, the nonillness-based early pension includes unemployment pensions, farmers’ early pensions, and part-time pensions.

### Assessment of covariates

The assessment of occupation (7), education (8), maximal oxygen uptake (9), smoking (10, 11), body mass index (BMI) (12), and alcohol consumption (13) has been explained previously in detail. Information on chronic

baseline illnesses was obtained from the questionnaire, interview, and a physical examination. The chronic illnesses diagnosed by a physician were grouped into the following four categories: (i) musculoskeletal disorders (including low-back problems and osteoarthritis), (ii) cardiovascular diseases (including coronary heart disease, cardiac insufficiency, hypertension, claudication and stroke), (iii) mental disorders, and (iv) other chronic illnesses.

### Statistical methods

The endpoint for the follow-up was defined as the date when the early pension was awarded or when a person began to receive an old age pension or the end of the follow-up on 31 May 2000, whichever came first. The association between low perceived health and risk of early retirement was analyzed using Cox's regression analysis with adjustment for possible confounders. Men in the lowest third of the perceived health category were compared with men in the middle and highest thirds. The results have been expressed as risk ratios (RR) and their 95% confidence intervals (95% CI) (14).

Age, education, maximal oxygen uptake, alcohol consumption, smoking, BMI, and the most prevalent baseline diseases (musculoskeletal disorders, cardiovascular diseases, mental disorders, and other chronic illnesses) were

added to the model as potential confounding variables. Age, maximal oxygen uptake, alcohol consumption, smoking, and BMI were used as continuous variables, and other confounders were categorized. SPSS 10.0 for Windows (SPSS Inc, Chicago, IL, USA) was used for the statistical analyses.

## Results

### Characteristics of the participants

The men who were awarded either a disability pension or a nonillness-based pension were older, were less educated, and had a lower maximal oxygen uptake than those who stayed at work until 65 years of age or who were still working at the end of the follow-up. Both the disability retirees and the nondisability retirees had a higher baseline musculoskeletal and cardiovascular morbidity, and they considered their health to be worse than the old-age retirees and the working men did (tables 1 and 2).

### Retirement during the follow-up

During the follow-up, 855 (48.9%) men received a disability pension, and 331 (18.9%) received a nonillness-based

**Table 1.** Age, body mass index (BMI), alcohol consumption, smoking, and maximal oxygen uptake of the participants.

Group	Age (years)		BMI (kg/m <sup>2</sup> )		Alcohol (g/week)		Smoking (cigarettes/day)		Maximal oxygen uptake (kg/ml)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Disability retirees (N=855)	52.5	4.1	26.8	3.6	76.3	122.0	5.7	9.9	2417.2	585.5
Nonillness-based retirees (N=331)	53.9	3.0	26.6	3.5	72.0	155.5	5.1	9.5	2477.1	535.1
Working men and old age pensioners (N=562)	49.46	6.27	26.4	3.12	77.3	120.6	5.1	9.9	2717.7	626.7

**Table 2.** Occupation, education, and health characteristics of the participants.

Group	Occupation (%)			Education (%)			Baseline illness (N=1611) (%)			Self-assessed health (%)			Self-assessed health compared with that of other men of the same age (%)		
	Farming (N=342)	Blue-collar (N=640)	White-collar (N=744)	High school or above (N=147)	Middle school (N=661)	Elementary school or less (N=946)	Musculo-skeletal (N=757)	Cardio-vascular <sup>b</sup> (N=883)	Mental <sup>c</sup> (N=68)	Poor (N=162)	Average (N=849)	Good (N=741)	Worse (N=334)	Same (N=1012)	Better (N=405)
Disability retirees (N=855)	19.4	39.9	40.7	5.7	35.9	58.4	49.0	58.0	4.3	12.6	53.6	33.8	26.2	55.1	18.7
Nonillness-based retirees (N=331)	27.4	39.2	33.4	5.4	33.2	61.3	43.5	51.7	3.9	10.3	48.6	41.1	18.1	55.3	26.6
Working men and old age pensioners (N=562)	15.7	31.5	52.8	14.3	43.0	42.8	34.0	37.7	3.0	3.2	40.7	56.0	8.4	63.7	27.9

<sup>a</sup> Includes back problems and osteoarthritis.

<sup>b</sup> Includes coronary heart disease, cardiac insufficiency, hypertension, claudication, and stroke.

<sup>c</sup> Includes mental problems and mental illnesses.

pension. Of the disability retirees, 158 (18.4%) were under 55 years of age and 697 (81.6%) were 55 years or older at the time of retirement. The mean age of retirement was 58.2 (SD 3.88) years. Only 273 (15.6%) of the 1755 men had retired at the official retirement age of 65 years. The diagnostic reasons for the disability pensions were musculoskeletal disorders (N=339, 39.6%), cardiovascular diseases (N=240, 28.1%), mental disorders (N=146, 15.2%), and other diseases (N=130, 15.1%).

### Self-perceived health and confounding factors

The men who considered their health to be poor were older ( $P<0.001$ ) and heavier ( $P<0.001$ ), used more alcohol ( $P<0.001$ ), smoked more ( $P<0.001$ ), and had a lower maximal oxygen uptake ( $P<0.001$ ) than the others did (tables 3 and 4). Most of the white-collar workers reported that their health was good (53.2%), whereas most (51.4%) of the blue-collar workers and farmers perceived their health as average ( $P<0.001$  for difference). Most of those who had a high school or middle school education considered their health to be good (60.5%), while those who had an elementary school education or less considered it to be average ( $P<0.001$  for difference). Those who had a musculoskeletal, cardiovascular, or mental illness perceived

their health to be average (tables 3 and 4). The associations of own perceived health in comparison with that of other men the same age and background factors agreed with the results obtained for perceived health.

### Perceived health and risk of early retirement

Poor perceived health at baseline was strongly associated with the risk of both illness-based and nonillness-based pensions even after adjustment for baseline illnesses and other potential confounding factors (table 5). Of the separate disease categories, the association was strongest with disability due to mental illnesses (RR 4.13, 95% CI 2.04–8.37). Perceived poor health was also a strong predictor of early retirement due to cardiovascular diseases (RR 3.47, 95% CI 2.13–5.67). Perceived poor health did not increase the risk of early retirement before the age of 55 years (RR 1.38, 95% CI 0.56–3.44), but thereafter it did (RR 2.55, 95% CI 1.90–3.43).

### Discussion

The perceived poor health of middle-aged men was a strong predictor of early retirement, whether the pension

**Table 3.** Age, body mass index (BMI), alcohol consumption, smoking and maximal oxygen uptake by the level of perceived health.

	Age		BMI		Alcohol (g/week)		Smoking (cigarettes/day)		Maximal oxygen uptake (kg/ml)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Perceived health										
Poor	53.6	3.8	27.6	4.3	115.6	238.2	8.6	11.9	2109.6	580.4
Average	52.4	4.7	26.9	3.4	76.3	123.0	6.6	10.6	2415.4	552.3
Good	50.7	5.4	26.2	3.1	66.6	95.3	3.3	7.8	2734.8	589.3
Perceived health compared with that of other men of the same age										
Worse	52.9	4.1	27.2	3.9	99.2	200.7	7.3	11.6	2168.2	555.4
Same	51.0	5.2	26.6	3.4	73.7	108.6	5.5	9.7	2576.7	554.9
Better	52.8	4.8	26.3	3.1	61.7	91.4	3.5	8.2	2684.0	648.5

**Table 4.** Occupation, education, and health characteristics by the level of self-perceived health.

	Occupation (%)			Education (%)			Baseline illness (N=1611) (%)		
	Farming (N=342)	Blue-collar (N=640)	White-collar (N=744)	High school or above (N=147)	Middle school (N=661)	Elementary school or less (N=946)	Musculoskeletal <sup>a</sup> (N=757)	Cardiovascular <sup>b</sup> (N=883)	Mental <sup>c</sup> (N=68)
Perceived health									
Poor	11.4	11.4	6.2	4.1	6.2	12.0	14.6	14.0	11.9
Average	59.4	51.4	40.6	35.4	41.2	55.7	53.4	54.9	62.7
Good	29.1	37.1	53.2	60.5	52.6	32.3	32.0	31.1	25.4
Perceived health compared with that of other men of the same age									
Worse	23.2	21.2	15.2	10.9	15.8	22.4	26.4	29.2	25.4
Same	56.2	59.7	56.9	59.9	56.8	58.4	54.1	53.1	56.7
Better	20.6	19.1	28.0	29.3	27.4	19.2	19.5	17.6	17.6

<sup>a</sup> Includes back problems and osteoarthritis.

<sup>b</sup> Includes coronary heart disease, cardiac insufficiency, hypertension, claudication, and stroke.

<sup>c</sup> Includes mental disorders diagnosed by a physician.

**Table 5.** Adjusted<sup>a</sup> relative risks (RR) for early pensioning by the level of self-assessed health and perceived health compared with that of other men of the same age—Cox regression modeling. (95% CI = 95% confidence interval)

	Main reason for disability pension								Nonillness-based pension (N=331)	
	Any disability pension (N=855)		Musculoskeletal disease (N=339)		Cardiovascular disease (N=240)		Mental illness (N=146)		RR	95% CI
	RR	95% CI	RR	95% CI	RR	95% CI	RR	95% CI		
Self-assessed health										
Poor	2.69	2.04–3.56	2.83	1.80–4.44	3.25	2.02–5.23	4.13	2.04–8.37	3.36	2.20–5.13
Average	1.40	1.18–1.66	1.60	1.23–2.09	1.55	1.11–2.16	1.33	0.89–1.99	1.11	0.86–1.44
Good	1.0		1.0		1.0		1.0		1.0	
Self-assessed health compared with that of other men of the same age										
Worse	2.15	1.68–2.73	2.40	1.66–3.45	3.60	2.22–5.85	2.94	1.62–5.32	2.18	1.51–3.16
Same	1.29	1.06–1.57	1.34	0.99–1.80	1.94	1.25–3.03	1.38	0.86–2.22	1.17	0.89–1.55
Better	1.0		1.0		1.0		1.0		1.0	

<sup>a</sup> Adjusted for age, education, occupation, body mass index, alcohol consumption, smoking, maximal oxygen uptake, and respective reason for retirement (cardiovascular diseases, musculoskeletal diseases or mental problems).

was illness-based or not. Poor perceived health had the strongest association with the risk of disability due to mental illness, although the risk was significantly increased in other disease categories as well.

Månsson & Råstam (6) and Biering-Sørensen et al (5) have shown that poor perceived health is associated with an increased risk of receiving a disability pension. In a Finnish 11-year follow-up study, 60% of those who perceived their work ability to be poor gained a disability pension during the follow-up (15). On the other hand, 90% of those who assessed their health as very good were still working at the end of the follow-up. Thus the results of the few earlier studies support the findings of our study, although the association of perceived health with disability pensions has not been reported earlier according to division into different disease categories (musculoskeletal, cardiovascular or mental), as we did.

Perceived health seems to be a strong health indicator. Poor perceived health has been associated with increased mortality (16–20), and future functional disability (21). Wu et al (22) concluded that perceived poor health is a predictor of anxiety and depression. Moreover, Kivinen et al (23) and Kaplan et al (24) have shown a strong association between self-rated health and depression. Together with previous evidence, our present study indicates that poor perceived health is the most closely associated with a risk of retirement due to a mental disorder.

The assessment of perceived health used in our study is based on self-estimation. Although the measure provides fairly crude information on perceived health, it has been found to be useful in evaluating health status and in predicting future health behavior (25). For our cohort of middle-aged men, perceived health was one of the most important predictors of early retirement, in addition to objectively measured low maximal oxygen uptake (26) and high physical workload or poor work postures (27).

The size of this cohort was large and representative of men, at least in eastern Finland. Unfortunately no women

were included in the baseline study in the 1980s, and thus the results can be generalized only for men. The prospective study design and long follow-up offers some possibilities for assessing causality. The retirement data were comprehensive and reliable because the pension information came from the pension institutions covering all Finnish citizens. This statement is true for all disability pensions, but perhaps not quite so for disease-specific pensions. Disability is seldom caused by just one disease, but it is usually a sum of many diseases.

Thus far, perceived health is poorly understood conceptually. At least depression, coronary heart disease, dysuria (23), obesity (28), physical activity (29), gender, race, and education (4) have been associated with self-assessed health. Simon et al (30) showed that effective treatment of depression in its acute phase improved self-rated overall health. In our study, age, BMI, alcohol consumption, smoking, occupation, education, maximal oxygen uptake, and different illnesses at baseline were strongly associated with perceived health. On the basis of these findings, it can be concluded that, to prevent the negative effects of poor perceived health, such as early retirement, attention should be paid to a person as a whole, to his or her lifestyle, and to socioeconomic factors, not merely to one symptom or a disease.

In Finland, occupational health professionals use a self-report questionnaire to determine a work ability index, which is then used as a tool in estimating an employee's work ability. It is composed of several questions whose sum score is calculated by a nurse or a physician. In our study, two simple questions were highly predictive, and it seems that self-assessed health could be simply evaluated without using complex questionnaires.

In conclusion, self-assessed poor health is a strong predictor of early disability due to mental disorders, musculoskeletal disorders, and cardiovascular diseases, as well as a strong predictor of nonillness-based pensioning. Since there is socioeconomic pressure to control early

departure from worklife, the predictors of poor perceived health should be studied more carefully. Thus it seems that self-assessment of one's health as poor may be a good indicator that the person needs support to avoid future retirement. This support may vary and should be considered individually.

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