

## FINNISH FARMERS' SELF-REPORTED MORBIDITY, WORK ABILITY, AND FUNCTIONAL CAPACITY

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Perkiö-Mäkelä MM: Finnish farmers' self-reported morbidity, work ability, and functional capacity. *Ann Agric Environ Med* 2000, 7, 11–16.

**Abstract:** The aim of the study was to evaluate Finnish farmers' self-reported morbidity, especially musculoskeletal disease and disabilities, work ability, physical fitness, and functional capacity. A further goal was to identify the group of farmers that most need a means to promote their work ability. The data were collected with a computer-assisted telephone interview. The study population comprised of 577 full-time farmers (296 men and 281 women). The results have been expressed as odds ratios with 95% confidence intervals determined in a logistic regression analysis. The farmers with the greatest need for activities that support and promote work ability are those over 34 years of age, female farmers, farmers with fewer than 10 years of education, farmers from farms with fewer than 20 hectares of cultivated land, farmers who milk cows regularly, and depressed farmers.

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**Key words:** agriculture, depression, musculoskeletal disease, physical fitness, promotion of work ability.

### INTRODUCTION

There are about 90,000 active farms in Finland, each with an average arable area 23.9 hectares. Almost 88% of the active farms are privately owned. In 1997, 45% of the active farms primarily produced a crop while 40% were primarily cattle farms, and pig or poultry farming was the main activity of 8% [9].

Up until 1990 self-reported morbidity was higher among farmers than among other socioeconomic groups in Finland [11, 13]. During the 1990s Finnish farmers' self-reported morbidity decreased, although female farmers still reported more chronic diseases, especially those which limited their work capacity, as compared with blue- and white-collar female workers. Such a difference was not apparent for men [14]. Swedish farmers have a lower morbidity and a lower risk for hospitalization than the majority of other workers in Sweden. Ill health has been a more common cause of

work change among farm workers, but it was not shown to be more common among farm owners than among a group of referents [18].

Farming is a high-risk occupation for musculoskeletal disorders and related disability [6, 11, 15]. Seventy-seven percent of the medical certificates for disability pensions include at least one musculoskeletal diagnosis, whereas 38% include a cardiovascular disease, and only 11% list a mental disorder. The most common musculoskeletal causes of work disability are low-back disorders, neck-shoulder disorders and knee osteoarthritis [8].

Despite the mechanization and automatization of jobs due to intensive rationalization during recent decades, several physically demanding work tasks are still found in agriculture [1, 15]. In order to avoid physical overstrain, farmer's work ability and functional capacity should be moderate or good. However, farmers perceive their work ability as lower than do other occupational groups in Finland [14].

**Table 1.** Prevalence of chronic disease, problems at work caused by a disease, musculoskeletal diseases and farmers who perceived their work ability, physical fitness and functional capacity<sup>a</sup> as moderate or poor (N = 577).

Independent variable	N	Chronic disease (%)	Problems at work caused by a disease (%)	Musculoskeletal disease (%)	Work ability (moderate or poor) (%)	Physical fitness (moderate or poor) (%)	Restricted functional capacity <sup>a</sup> (%)
Age, years							
18–34	139	22	14	9	22	41	20
35–44	145	34	25	14	47	59	32
45–54	142	39	30	23	69	62	52
55–65	151	56	42	30	85	74	68
Gender							
Male	296	36	27	18	52	53	36
Female	281	40	30	20	61	66	51
Education, years							
≥ 10	221	30	20	14	35	50	25
0–9	356	44	33	22	70	66	55
Area of cultivation, hectares							
≥ 20	274	34	22	16	51	57	37
0–19.9	303	43	34	22	61	62	50
Operation							
Milking	295	40	29	20	61	61	47
Other	282	37	27	18	52	57	40
Depression							
No	517	36	25	16	53	58	41
Yes	60	57	52	42	83	68	62
Mean		38	28	19	56	59	44

<sup>a</sup>At least one perceived restriction of the following functions: climbing stairs; running 100 meters; walking 1 km; squatting; sitting for at least 30 minutes; reaching up for goods on high shelves.

The aim of this study was to evaluate Finnish farmers' self-reported morbidity, especially musculoskeletal disease, work ability, physical fitness and functional capacity. A further goal was to identify the group of farmers that most need a means to promote their work ability.

## SUBJECTS AND METHODS

**Subjects.** The subjects were a random sample of Finnish farmers who were insured by the Finnish Farmers' Social Insurance Institution. The sample size was 1,200 farmers, of whom 936 could be contacted by telephone, 67 refused to be interviewed, 115 no longer worked in agriculture, and 174 were part-time farmers. Three farmers had missing observations concerning depression and were excluded from the study. The final study group included 577 full-time farmers (at least 60% of their income derived from agriculture), 296 men and 281 women, who comprised 48% of the original sample and 92% of the full-time farmers contacted by telephone. The mean age was 44.8 (SD 12.0) years for the men and 44.9 (SD 11.1) years for the women. The age and gender distribution was similar to that of farmers insured by the Finnish Farmers' Social Insurance Institute [7], and the loss of subjects was similar across the age groups of the men and women.

Sixty-seven percent of the farmers tended cattle (beef and dairy), of whom 76% milked cows regularly, 7% raised pigs, while 1% concentrated on chickens and 2% on other animals. Thirteen percent cultivated various

grains, 2% potatoes, 2% root plants and 2% other plants. Forestry was the main farming operation for 3% of the study population. The average area of cultivation was 22.8 (SD 18.0) hectares.

**Methods.** A computer-assisted telephone interview was carried out in May-June 1990 by specially trained personnel at the Kuopio Regional Institute of Occupational Health.

The dependent variables were based on the following questions:

- Do you have some chronic disease or injury diagnosed by physician? (yes/no)
- Does your disease cause you problems at work or with daily activities? (yes/no)
- Do you have any chronic respiratory, cardiovascular, skin, or musculoskeletal disease or injury that has been diagnosed by a physician? (yes/no)
- What is the musculoskeletal disease or injury? (back, neck, upper-limb, lower-limb disease or injury, rheumatoid arthritis or other)
- How do you perceive your work ability at the moment? Is it good, moderate or poor? Why do you feel that your work ability is not good at the moment?
- How do you perceive your physical fitness at the moment? Is it good, moderate or poor? Why do you feel that your physical fitness is not good at the moment?
- Can you climb stairs, run 100 meters, walk 1 kilometer, squat, sit for at least 30 minutes, and reach goods on high shelves without difficulties? (yes/no)

**Table 2.** Risk factors for chronic disease, problems at work caused by a disease and musculoskeletal disease - odds ratios (OR) with 95% confidence intervals (95% CI) (N = 577).

Independent variable	Chronic disease				Problems at work caused by a disease				Musculoskeletal disease			
	Crude		Mutually adjusted		Crude		Mutually adjusted		Crude		Mutually adjusted	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age, years												
18–34	1.0		1.0		1.0		1.0		1.0		1.0	
35–44	1.8	1.1–3.1*	1.9	1.1–3.3*	2.1	1.1–3.9*	2.1	1.1–4.1*	1.7	0.8–3.7	2.0	0.9–4.5
45–54	2.2	1.3–3.7**	2.2	1.2–4.0**	2.7	1.5–5.1**	2.6	1.3–5.3**	3.1	1.5–6.5**	3.6	1.7–8.4**
55–65	4.5	2.7–7.6***	4.4	2.4–8.3***	4.6	2.6–8.5***	4.4	2.2–8.9***	4.6	2.4–9.6***	5.6	2.5–12.9***
Gender												
Male	1.0		1.0		1.0		1.0		1.0		1.0	
Female	1.2	0.8–1.6	1.1	0.8–1.6	1.2	0.8–1.7	1.1	0.7–1.6	1.1	0.7–1.7	1.0	0.7–1.6
Education, years												
≥ 10	1.0		1.0		1.0		1.0		1.0		1.0	
0–9	1.8	1.3–2.6**	1.0	0.6–1.5	2.0	1.3–3.0***	1.0	0.6–1.6	1.6	1.1–2.6*	0.7	0.4–1.2
Area of cultivation, hectares												
≥ 20	1.0		1.0		1.0		1.0		1.0		1.0	
0–19.9	1.5	1.0–2.1*	1.3	0.9–1.9	1.8	1.3–2.6**	1.6	1.1–2.4*	1.5	1.0–2.3*	1.3	0.9–2.1
Operation												
Milking	1.1	0.8–1.6	1.1	0.8–1.6	1.1	0.8–1.6	1.1	0.7–1.6	1.2	0.8–1.8	1.2	0.8–1.9
Other	1.0		1.0		1.0		1.0		1.0		1.0	
Depression												
No	1.0		1.0		1.0		1.0		1.0		1.0	
Yes	2.3	1.3–4.0**	2.1	1.2–3.7**	3.1	1.8–5.4***	2.9	1.6–5.1***	3.6	2.1–6.4***	3.4	1.9–6.1***

\* p &lt; 0.05; \*\* p &lt; 0.01; \*\*\* p &lt; 0.001

The results are presented in strata according age group (18–34, 35–44, 45–54, 55–65 years) and gender (male, female). The other independent variables were based on the following questions:

- How many years did you attend school or study full time? Elementary and comprehensive school should be included.
- What is the area of cultivation of your farm, including your own and any leased area?
- What is the main operation of your farm? (cattle, swine, chicken, other animals, grains, potato, root plant, other plants, forestry). Those tending cattle were also asked: Do you milk cows regularly? (yes/no)
- Do you feel depressed at the moment? (yes/no)

The statistical analysis was carried out by the SAS (Statistical analysis system) software (version 6.12) with a logistic regression (proc genmod) analysis. The results have been expressed with crude and mutually adjusted (age + gender + education + area of cultivation + operation + depression) odds ratios with their 95% confidence intervals. The differences were considered significant when p < 0.05.

## RESULTS

**Morbidity.** Thirty-eight percent of the farmers had a chronic disease diagnosed by a physician (Tab. 1) and 72% of those with a diagnosis had problems at work caused by a disease. Musculoskeletal disease was the most common chronic disease (prevalence 19%), followed by cardiovascular disease (prevalence 11%), respiratory

disease (prevalence 9%) and skin disease (prevalence 5%). Of those who had a musculoskeletal disease 90% had problems at work caused by a disease, the corresponding figure being 78% for skin disease, 75% for respiratory disease and 58% for cardiovascular disease.

**Table 3.** Prevalence of back, neck, upper- or lower-limb disease (N = 577).

Independent variable	N	Diseases			
		Back (%)	Neck (%)	Upper-limb (%)	Lower-limb (%)
Age, years					
18–34	139	5	2	1	1
35–44	145	10	2	2	3
45–54	142	13	4	1	5
55–65	151	14	6	3	8
Gender					
Male	296	9	3	2	6
Female	281	11	4	2	2
Education, years					
≥ 10	221	9	2	1	1
0–9	356	11	4	3	6
Area of cultivation, hectares					
≥ 20	274	7	1	3	4
0–19.9	303	13	5	1	5
Operation					
Milking	295	11	4	3	4
Other	282	10	3	1	5
Depression					
No	517	10	3	1	3
Yes	60	15	10	7	12
Mean		10	3	2	4

**Table 4.** Risk factors for back, neck, and upper- or lower-limb disease - odds ratios (OR) with 95% confidence intervals (95% CI) (N = 577).

Independent variable	Diseases															
	Back				Neck				Upper-limb				Lower-limb			
	Crude		Mutually adjusted		Crude		Mutually adjusted		Crude		Mutually adjusted		Crude		Mutually adjusted	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age, years																
18-34	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
35-44	2.0	0.8--5.5	2.3	0.9-6.7	1.0	0.2-5.3	0.7	0.1-4.5	1.4	0.2-11.1	0.9	0.1-7.5	3.9	0.6-77.0	3.1	0.4-64.1
45-54	2.7	1.1-7.2*	3.4	1.3-9.8*	1.7	0.4-8.2	1.0	0.2-6.1	0.5	0.0-5.1	0.2	0.0-3.1	7.2	1.2-134.7	4.6	0.7-94.4
55-65	3.0	1.3-8.0**	3.8	1.4-11.1**	2.9	0.8-13.2	1.7	0.4-9.7	2.3	0.5-16.6		0.2-11.5	11.9	2.3-218.4*	6.8	1.0-136.4
Gender																
Male	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
Female	1.2	0.7-2.1	1.2	0.6-2.0	1.6	0.7-4.2	1.4	0.5-3.8	0.9	0.2-2.9	0.8	0.2-2.8	0.4	0.2-1.0	0.4	0.2-1.0
Education, years																
≥ 10	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
0-9	1.3	0.7-2.3	0.6	0.3-1.3	2.6	0.9-9.0	1.5	0.4-6.9	2.8	0.7-18.7	3.1	0.5-25.9	4.6	1.5-19.4*	2.1	0.6-10.4
Area of cultivation, hectares																
≥ 20	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
0-19.9	1.9	1.1-3.5*	1.8	1.0-3.4*	3.8	1.4-13.3*	3.0	1.0-10.9	0.5	0.1-1.7	0.4	0.1-1.4	1.3	0.6-3.0	1.0	0.4-2.5
Operation																
Milking	1.0	0.6-1.8	1.0	0.6-1.8	1.5	0.6-3.8	1.4	0.5-3.7	4.4	1.1-29.1	4.1	1.0-27.7	0.8	0.3-1.8	0.9	0.4-2.1
Other	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0	
Depression																
No	1.0		1.0		1.0		1.0		1.0	0.7-18.7	1.0		1.0		1.0	
Yes	1.6	0.7-3.3	1.5	0.6-3.1	4.0	1.4-10.4**	3.0	1.0-8.2*	5.2	1.3-17.8*	4.6	1.1-16.7*	3.9	1.4-9.5**	3.5	1.2-8.8*

\* p &lt; 0.05; \*\* p &lt; 0.01

The greater the age or degree of depression or the shorter the education or the smaller the farm (cultivated area), the greater the prevalence of chronic disease, problems at work caused by a disease and musculoskeletal disease. When other independent variables were adjusted for, the prevalence of chronic disease, problems at work caused by a disease and musculoskeletal disease increased with increasing age and depression. Problems at work caused by a disease were more common among the farmers whose cultivated area was less than 20 hectares than among the farmers from bigger farms (Tab. 2).

Back disease was the most common musculoskeletal disease (prevalence 10%), followed by lower-limb (4%), neck (3%) and upper-limb disease (2%), rheumatoid arthritis (1%) and other musculoskeletal disease (2%) (Tab. 3). Back and lower-limb disease were more common among the farmers over 44 years of age than among the younger ones. Farmers from small farms more often reported back and neck disease than farmers from big farms. Farmers who felt depressed at the time of the interview more often had neck and upper- and lower-limb disease than farmers who were not depressed (Tab. 4).

**Work ability.** Less than half (44%) of the farmers perceived their work ability as good. The most common reason given for a moderate or poor work ability was a somatic disease (45%) or factors associated with aging (29%).

Age, gender, education, area of cultivation, milking and depression were associated with perceived work ability. When other independent variables were adjusted for, age and depression were associated with work ability (Tab. 5).

**Physical fitness.** Forty-one percent of the farmers perceived their physical fitness as good. The most common reason for a moderate or poor response was a disease (36%) or the lack of sufficient physical exercise (20%). Older farmers, female farmers and less educated farmers perceived their physical fitness more often as moderate or poor than did younger farmers, male farmers and farmers who had at least 10 years of education. When the other independent variables were adjusted for, female farmers and farmers over 34 years of age perceived their physical fitness more often as moderate or poor than did the men and farmers between 18–34 years of age (Tab. 5).

**Functional capacity.** Almost half of the farmers (44%) had restricted functional capacity. The most common reasons for such restriction were back pain (12–70% depending on the type of task) and knee pain (0–56% depending on the type of task).

Age, gender, education, area of cultivation, and depression were associated with poor functional capacity. When the other independent variables were adjusted for, age, gender, education and depression were associated with perceived functional capacity (Tab. 5).

## DISCUSSION

Thirty-eight percent of the farmers had a chronic disease diagnosed by physician and 72% of those farmers perceived problems at work caused by a disease. Musculoskeletal disease was the most common form of chronic disease among the farmers, and 90% of the

**Table 5.** Risk factors for work ability, physical fitness and functional capacity<sup>a</sup> - odds ratios (OR) with 95% confidence intervals (95% CI) (N = 577).

Independent variable	Work ability (poor or moderate)				Physical fitness (poor or moderate)				Restricted functional capacity <sup>a</sup>			
	Crude		Mutually adjusted		Crude		Mutually adjusted		Crude		Mutually adjusted	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age, years												
18-34	1.0		1.0		1.0		1.0		1.0		1.0	
35-44	3.1	1.8-5.2***	2.6	1.5-4.7***	2.0	1.3-3.3**	1.9	1.1-3.1*	1.9	1.1-3.3*	1.4	0.8-2.5
45-54	7.8	4.6-13.4***	6.0	3.2-11.4***	2.3	1.5-3.8***	2.1	1.2-3.7**	4.3	2.6-7.4***	2.8	1.5-5.2***
55-65	19.4	10.9-36.0***	15.5	7.9-31.7***	4.1	2.5-6.8***	3.7	2.1-6.8***	8.3	4.9-14.3***	5.4	2.9-10.3***
Gender												
Male	1.0		1.0		1.0		1.0		1.0		1.0	
Female	1.5	1.1-2.1*	1.5	1.0-2.2	1.7	1.2-2.4**	1.7	1.2-2.5**	1.9	1.3-2.6***	2.0	1.4-2.9***
Education, years												
≥ 10	1.0		1.0		1.0		1.0		1.0		1.0	
0-9	4.3	3.0-6.2***	1.5	1.0-2.4	1.9	1.3-2.7***	1.1	0.7-1.7	3.6	2.5-5.2***	1.8	1.1-2.9**
Area of cultivation, hectares												
≥ 20	1.0		1.0		1.0		1.0		1.0		1.0	
0-19.9	1.5	1.1-2.2**	1.2	0.8-1.8	1.2	0.9-1.7	1.1	0.7-1.5	1.7	1.2-2.3**	1.3	0.9-1.9
Operation												
Milking	1.4	1.0-2.0*	1.4	1.0-2.1	1.2	0.8-1.6	1.0	0.7-1.5	1.3	0.9-1.8	1.2	0.8-1.7
Other	1.0		1.0		1.0		1.0		1.0		1.0	
Depression												
No	1.0		1.0		1.0		1.0		1.0		1.0	
Yes	4.4	2.3-9.4***	4.7	2.2-10.8***	1.5	0.9-2.8	1.4	0.8-2.6	2.3	1.3-4.0**	2.0	1.1-3.6*

<sup>a</sup> At least one perceived restriction of the following functions: climbing stairs; running 100 meters; walking 1 km; squatting; sitting for at least 30 minutes; reaching up for goods on high shelves. \* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001.

farmers in this group reported problems at work caused by a disease.

The male farmers' prevalence of chronic disease was on the same level as that of male blue-collar workers and on a higher level than that of white-collar workers in Finland. The female farmers had a higher prevalence of chronic disease than female blue- and white-collar workers. Both studies were based on telephone interviews [2, 12]. These results do not agree with those of a study from Sweden, according to which the morbidity rates were generally low for the farmers [17]. The Swedish study was based on national hospital records, and this difference may explain some of the differences because, at least in Finland, farmers use health services less than other occupational groups [14].

In our study, 19% were crop farmers compared to 45% in Finland. This could have had some influence on the results, because female farmers from crop farms had somewhat less chronic diseases than female farmers from other operations [14].

Farming seems to be a high-risk occupation for musculoskeletal disorders and related disability [6, 11, 15]. In our study, back disease was the most common among the farmers on small farms. This finding agrees with those of other studies, according to which back pain is an occupational health problem among farmers on small or family farms [20]. Upper-limb disease was somewhat more common among farmers who milked cows regularly. This result agrees with the findings of Stål *et al.* [16], who found that milkers run a higher risk of developing symptoms in their wrists and hands than nonmilkers.

Our farmers believed that their work ability was poorer than did blue- and white-collar workers in an earlier study [14]. In our study, more than half of the farmers (56%) perceived their work ability as only moderate or poor, and nearly half of the farmers (44%) reported restricted function that interfered with their everyday activities. The farmers over 34 years of age, female farmers, and farmers who milked regularly were especially high risk groups with respect to work ability and functional capacity. The risk tended to accumulate among the same subjects: 63% of women and 40% of men milked regularly, and the 35–54 year-old farmers were the most active milkers.

The farmers over 34 years of age, the female farmers, the farmers who had less than 10 years of education, the farmers from farms with less than 20 hectares to cultivate, those who milked regularly and those who were depressed were found to be high-risk groups for chronic disease and problems at work caused by a disease, work ability and functional capacity. Work ability reflects the interaction between the work and the worker. It is influenced by several factors, such as the resources, functional capacity and professional skills of the worker, and by the conditions, content, and organization of the work and community.

Working on farms with less than 20 hectares and in dairy operations were found to be a risk factor. The number of hectares cultivated can be an indicator of the technological level of the farm. Ergonomic problems are more common on small farms and in cattle operations than on big farms and in other operations [19]. Work on small farms is hard and physically demanding especially for women. In Finland, women have traditionally taken

care of cattle and milking, while men have only recently become active in this domain. The functional capacity of female farmers and aging farmers [5] can be improved, and work on farms can be made physically lighter through changes in work methods and equipment [10].

The strength of this study was the good response rate (92%) and item response (99%). The computer-assisted telephone interview was chosen because of its good response rate and item response, rapidity, and suitability for studies with large, complex questionnaires [4]. Differences in answering topics concerning health have been found to be small between data from postal questionnaires and telephone interviews [3]. The researcher also made some interviews and interviewers were trained and monitored during the interviews. Since the questions have been widely used in Finland [2, 11, 14], a comparison between studies was possible.

There is a lack of studies on farmers' work ability and functional capacity. The identification of high-risk groups with respect to health, work ability and functional capacity is important in order to target and improve the efficiency of programs aiming at promoting the health and work ability of farmers.

#### Acknowledgments

The author wishes to thank Hilikka Riihimäki, MD, for her comments; Kaj Husman, MD, and Veijo Notkola, PhD, for their help with planning the study; Taina Koivisto, MSc, for her assistance with the data collection; Pentti Mäkelä, MSc for his advice on the statistical analysis, and Georgianna Oja, ELS, for her advice in correcting the language. This study was funded by the Farmers' Social Insurance Institution in Finland and by the Finnish Institute of Occupational Health.

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