


ORIGINAL ARTICLE

Networking of occupational health care units promotes reduction of permanent disability pensions among workers they care: A register-based study controlled by benchmarking with a 5-year follow-up

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Abstract

Objectives: Early retirement due to disability is a problem in Finland. That causes pension costs that are heavy for the society. This study was designed to find out whether a quality network can support the reduction in incident disability pensions and promote a shift from full to partial disability pensions.

Methods: The study population (N = 41 472 in 2016) consisted of municipal employees whose occupational health care (OHC) was provided by the members of the Finnish Occupational Health Quality Network (OQN). The comparison population consisted of all municipality employees whose OHC was provided by non-members of the OQN (N = 340 479 in 2016). The outcomes were measured by comparing the trends in incident disability pensions of full and partial permanent pension and full and partial provisional pension, partial/full pension indexes from 2011 to 2016 according to the principles of Benchmarking Controlled Trials. Linear regression models were used to explore the dynamics of different pension forms. Regression coefficients were calculated to show the average change per year.

Results: The incidence of permanent disability pensions decreased faster in the study population (*P* for trend .03) and the study group showed a stronger shift from full to partial permanent pensions (*P* for trend <.001).

Conclusion: Quality networking between OHC units including common goal setting, systematic quality improvement, and repeated quality measurements decreased new permanent disability pensions and increased partial permanent pensions. Such changes are important while thriving for increased work participation.

KEYWORDS

benchmarking, disability pension, networking, outcome, quality improvement

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1 | INTRODUCTION

The labor force in Western-European countries is aging¹; alongside this phenomenon, the goal of occupational health care (OHC) has been shifting from prevention of hazards at the workplace towards promotion of work participation and prevention of early retirement.² In Finland 0.9% of the employed workforce (16 900 individuals) were granted new disability pensions in 2016, a third of them because of mental disorders, mainly depression, and another third because of musculoskeletal disorders.³

The Finnish disability pension legislation has the following definitions: a disability pension is an early retirement pension granted to a person whose capacity to work is impaired because of an illness. The subtypes of disability pension are: (a) full permanent disability pension, (b) partial permanent disability pension, (c) full provisional pension, and (d) partial provisional pension. An individual must have a reduction in work capacity of over 60% to be eligible for a full disability pension, while a partial disability pension requires a reduction of 40-60%. A provisional pension can be applied when an individual's work capacity is reduced temporarily for at least a year.

The legislation on partial sick leave benefit was introduced during the year 2007 in Finland. It has been shown that people with mental or musculoskeletal disorders who take the part-time instead of full-time sick leave during the first 3 months of their illness have a slightly increased likelihood of work participation and returning to work.⁴⁻⁶

Several studies have demonstrated that musculoskeletal disorders and depression are important drivers for disability pension.⁷⁻⁹ Further risk factors for an early disability pension including partial disability pension are age over 50 years, poor professional competence, poor social skills, comorbid conditions, self-experienced poor working capacity, monotonous work, night work, and physical strain.^{10,11}

Recent studies have shown that comprehensive interventions at the work place may reduce work disability and return-to-work for musculoskeletal, pain-related, and mental health conditions.^{12,13} Intensive treatment of depression, and coordination of services offered for workers may improve work participation.¹⁴

Some OHC-based interventions have been shown to be effective in the prevention of early disability pension. Reorganization of OHC services including service coordination and rehabilitation for employees after injuries has been shown to prevent disability pensions.¹⁵ Early multimodal and vocational rehabilitation may reduce both sickness absenteeism and disability pensions.¹⁶ It has been suggested that the OHC should work more with prevention, and focus on "treating the organization," not the individual but leaving the executive measures to the company.¹⁷

Policy-makers and researchers have promoted improvement of OHC services to prolong the work careers.^{18,19} There

is some evidence that OHC can improve the prevention of disabilities,^{12,20} and also that networking may improve the quality and outcomes of health care²¹ but no studies on the effect of OHC units networking for systematic improvement on the numbers of disability pensions. Therefore, we designed a study to assess the impact of OHC networking including systematic process development with repeated quality measurements. We aimed to answer two questions: Can an affiliation to an OHC quality network reduce permanent disability pensions and can full disability pensions be replaced by partial disability pensions? Our hypothesis was that with shared quality improvement (QI) initiatives in an OHC network the set goals, which were reflected in our research questions, will be achieved.

2 | MATERIALS AND METHODS

2.1 | Quality improvement initiative

The QI program was developed by the Finnish Occupational Health Quality Network (OQN) which consists of autonomous OHC units. The OQN is a collaboration setting of several OHC units where the members support each other's development by the exchange of ideas, process descriptions, and other quality improvement materials with the intention to find the best practices.

The personnel of the OHC units in Finland have a versatile educational background. An OHC unit places OHC physicians, OHC nurses, OHC physiotherapists, OHC psychologists, and assisting personnel at work. The OHC personnel work in collaboration as a multidisciplinary team to support the employer to accomplish healthy working environment and employees to stay healthy in work.

Each OHC unit of the OQN has performed several QI activities since the start of the network in 2011. The units affiliated to the OQN have used the continuous quality development model in the development of OHC processes.²² To date, the OQN has worked with nine QI initiatives: (a) development of good, systematic work processes; (b) sharing of development ideas and experiences within the OQN; (c) repeated quality measurements of employers' and employees' satisfaction with the services provided by the OHC unit; (d) repeated quality measurements of the health check-ups, depression treatment, and interventions against excessive alcohol use; (e) remodeling of the employees' health check-ups, especially in the cases of work incapacity; (f) improvement of the multidisciplinary team work; (g) measurement of the incidence of disability pensions starting in 2014; (h) promotion of the three-party negotiations (employer, employee, and OHC personnel) when decreased work capacity requires adjustment to an employee's work role definition, and (i) protracted work modification to favor partial pensions instead of full pensions.

2.2 | Study population

The study and comparison populations consisted of municipal workers who were insured by Keva. Keva is the largest pension provider in Finland and it administers the pensions of public sector workers. The study population consisted of the employees ($N = 41\,472$ in 2016) of 21 municipal employers provided by six OHC units affiliated to the OQN from either 2011 or 2012 to 2016. The employer (the client company of the OHC unit) also had to agree to the follow-up of the incidents in the registers of Keva. The comparison population ($N = 340\,479$ in 2016) consisted of municipality employees whose OHC was provided by non-members of the OQN (Table 1). Employees whose OHC had been provided by an OHC unit with less than 5 years' affiliation to the OQN were excluded, as were those whose employer had not permitted the use of the pension register data. The pension data were provided by Keva for the years 2005-2016 in aggregated form combining the data for the 21 municipality employers and all other municipality employers for comparison.

2.3 | Study outcomes

We used the incidence of disability pensions as an outcome measure for the effectiveness of OHC. The incidence of disability pensions was calculated separately for the four pension types by dividing the number of the granted disability pensions by the number of insured employees. The incidences of all four types of disability pensions were counted starting from 2005 to exclude trends taking place before the intervention started in 2011. Joinpoint regression analyses were conducted to control the changes.

The partial/full pension indexes were counted in order to determine whether partial pensions could replace full pensions. The indexes were calculated by dividing the incidence

of granted partial disability pensions by the incidence of full disability pensions.

Additionally, we obtained the data on the decisions made on applications for disability pension and vocational rehabilitation (granted or not granted) in the years 2015 and 2016, which allowed us to check whether the decisions influenced the outcomes of this study.

2.4 | Statistical methods

We compared the trends in the incidence of granted disability pensions and partial/full pension indexes in the study and comparison populations according to the principles of Benchmarking Controlled Trials.²³ Linear regression models were used to explore the dynamics of different pension forms. Regression coefficients were calculated to show the average change per year from 2011 to 2016. The P -values corresponding to the difference in the regression coefficients were calculated and $P < .05$ were considered statistically significant.

All statistical analyses were performed using the IBM SPSS Statistics 20 software package and Joinpoint Trend Analysis software.

3 | RESULTS

The incidence of the permanent pensions decreased faster in the study population than in the comparison population (P -value for trend .03) and the partial/full pension index of permanent pensions favored the study population (Table 2).

The decrease in the incidence of all types of disability pensions together was faster in the comparison population (P -value for trend .004). The incidence of provisional pensions increased in both populations but faster in the study population (Table 2).

TABLE 1 The number of employees and their mean age in the study and comparison populations from the year 2005 to 2016

Year	Study population N	Mean age study population	Comparison population N	Mean age comparison population
2005	38 555	44.6	308 715	44.3
2006	38 242	44.8	313 699	44.5
2007	38 504	45.0	318 167	44.7
2008	40 895	45.2	324 804	44.8
2009	40 898	45.3	329 029	45.0
2010	40 851	45.4	328 284	45.1
2011	41 401	45.4	335 724	45.0
2012	42 502	45.4	340 261	45.0
2013	42 974	45.4	343 529	45.1
2014	42 460	45.4	341 134	45.1
2015	42 060	45.6	340 870	45.1
2016	41 472	45.6	340 479	45.2

Indicator	Statistical difference in trends	β -coefficient study population	β -coefficient comparison population
Incidences			
Full permanent disability pension	$P = .166$	-.300	-.197
Partial permanent disability pension	$P = .003$	-.021	-.033
Full and partial permanent disability pensions together	$P = .03$	-.320	-.230
Full provisional pension	$P = .007$	-.063	-.128
Partial provisional disability pension	$P = .086$	.224	.169
Full and partial provisional pensions together	$P = .001$	.161	.041
All disability pensions together	$P = .004$	-.159	-.189
Indexes			
Partial/full permanent disability pension	$P < .001$	.225	.110
Partial/full provisional pension	$P = .002$	.065	.009
Partial/full pension for both permanent and provisional pensions together	$P = .128$	.083	.065

TABLE 2 Trends in the incidence of different disability pensions among municipal employees in Finland between 2011 and 2016 in the study population ($N = 41\,472$ in 2016) and the comparison population ($N = 340\,479$ in 2016)

The incidence of permanent and provisional full pension had a declining trend in both populations and partial pensions an increasing trend before the study started (Figures 1 and 2). Joinpoint regression analyses showed a joinpoint in 2012 for full permanent pension in the study population and 2013 in the comparison population and also 2013 to the partial permanent

pensions for both populations. The joinpoints of the provisional pensions were earlier; for full pension 2010 in the study population and 2012 in the comparison population. In partial provisional pensions the corresponding years were 2011 and 2012. Trend analyses to compare the regression coefficients of the two populations for the years 2005-2010 confirmed

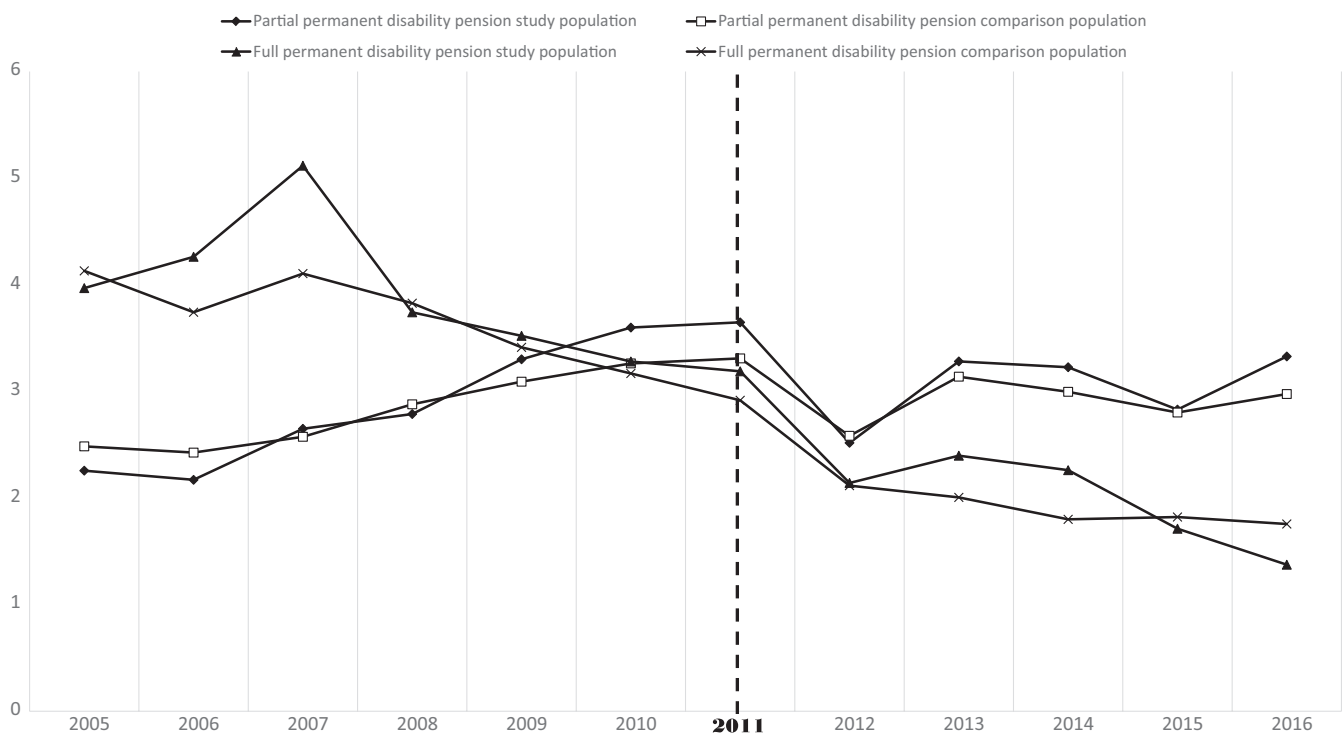


FIGURE 1 The incidences of full and partial permanent disability pensions per 1000 municipal employees in the study population ($N = 41\,472$ in 2016) and comparison population ($N = 340\,479$ in 2016) from 2005 to 2016. The study initiation year 2011 is marked with dotted line

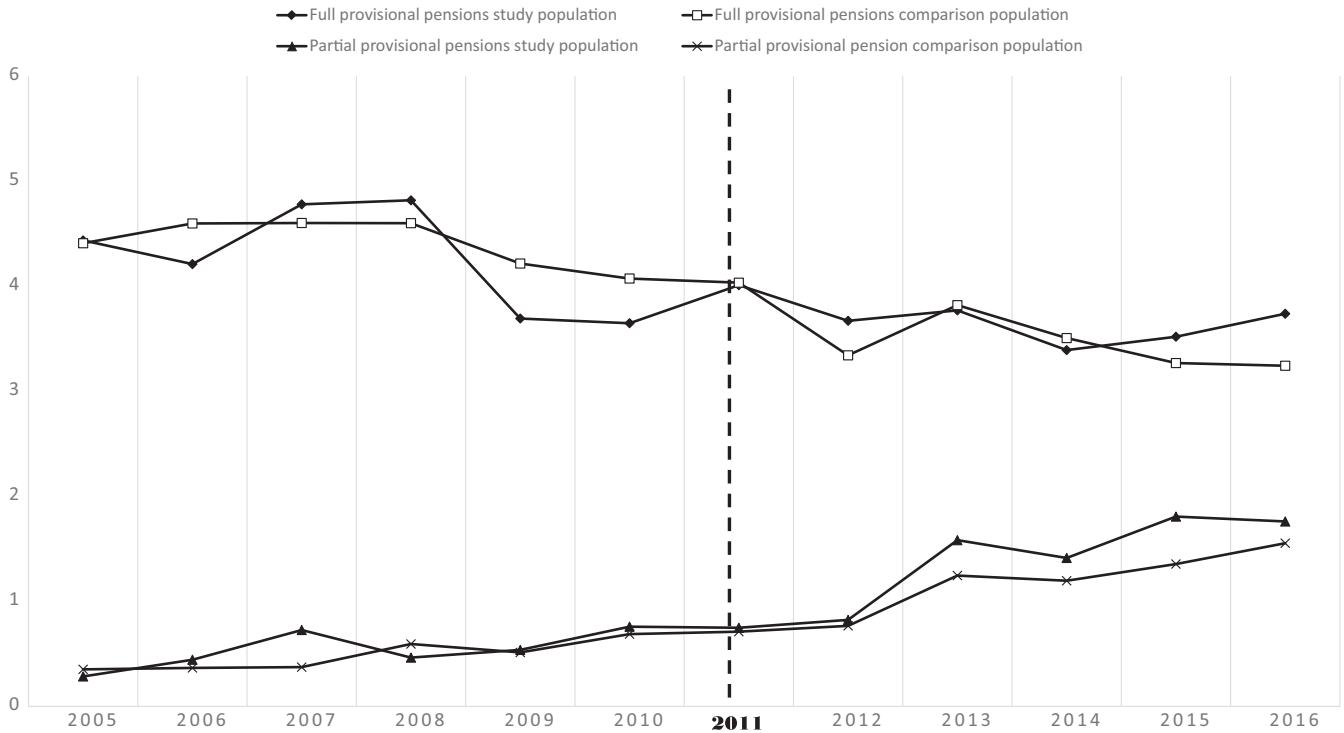


FIGURE 2 The incidences of full and partial provisional disability pensions per 1000 municipal employees in the study population (N = 41 472 in 2016) and comparison population (N = 340 479 in 2016) from 2005 to 2016. The study initiation year 2011 is marked with dotted line

these results; full pensions decreased faster and provisional pensions increased faster before the study start in the study population (*P* for trend in all pension forms <.001) (Table 3).

Applications for both disability pension and vocational rehabilitation were made more frequently in the study population in 2015 but not in 2016 (Table 4). Applications for vocational rehabilitation were rejected more often in the study population in 2015 (Table 4).

4 | DISCUSSION

Our study showed that from 2011 to 2016 the incidence of permanent pensions declined faster in the study population than in the comparison population, and permanent partial/full

pension index developed more favorably in the study population. These results indicate that the affiliation to the OQN promotes the reduction of new full permanent disability pensions and also the replacement of full permanent pensions with partial disability pensions. Thus, the two main aims of the OQN were achieved. The achievement of these predefined targets may have had some influence to increased work participation.

The increase in the incident partial disability pensions is in line with the previous findings that among employees who have an impairment in their work capacity, work participation can be improved by assignment of a part-time work pattern.⁴⁻⁶ Furthermore, our findings may confirm that in many cases a partial disability pension can replace a full pension^{24,25} and may be a means to support employees' work ability.^{24,25} Promoting work ability is challenging

TABLE 3 Trends in the incidence of different disability pensions among municipal employees in Finland between 2005 and 2010 in the study population (N = 40 851 in 2010) and the comparison population (N = 328 284 in 2010)

Indicator	Statistical difference in trends	β -coefficient study population	β -coefficient comparison population
Incidences			
Full permanent disability pension	<i>P</i> = .000	-.201	-.174
Partial permanent disability pension	<i>P</i> = .003	.293	.177
Full provisional pension	<i>P</i> = .000	-.156	-.081
Partial provisional disability pension	<i>P</i> = .006	.068	.067
All disability pensions together	<i>P</i> = .000	.004	-.011

Application/decision	Study group	Comparison group	Difference
Application for disability pension 2015	1.10% of employees	0.98% of employees	$P = .021$
Rejection of disability pension application 2015	20.9%	19.8%	$P = .574$
Application for disability pension 2016	1.14% of employees	1.06% of employees	$P = .128$
Rejection of disability pension application 2016	23.3%	20.0%	$P = .098$
Application for vocational rehabilitation 2015	0.58% of employees	0.46% of employees	$P = .001$
Rejection of rehabilitation application 2015	21.8%	16.0%	$P = .024$
Application for vocational rehabilitation 2016	0.50% of employees	0.46% of employees	$P = .253$
Rejection of rehabilitation application 2016	18.3%	15.1%	$P = .236$

TABLE 4 Applications and decisions for disability pension and vocational rehabilitation in 2015 and 2016

and demands collaboration and shared goal setting, including multidisciplinary and multidomain approaches, between the OHC, employer and employees.¹²

A novel finding of this study is that the affiliation to a quality network which is dedicated to quality improvement seems to increase the effectiveness of OHC. This adds one more clinical area that profits from networking to the earlier findings.²¹ Our findings also reveal a need for further goal setting and improvement work in the OQN.

The present study confirms the potential of promoting partial disability pensions instead of full pensions in order to support the residual work ability of employees with work incapacities.¹⁰ A prior study has noted the importance of long-term work modification.²⁴ Therefore, partial disability pensions should be seen as a discrete category of long-term work modification and not only as a part of the overall provision of pension benefits.²⁴

The results of our study also seem to be consistent with the results of an earlier study, which found that multi-focal interventions may improve work participation.¹⁴ The implementation of enhanced multidomain OHC processes to support employees with work incapacities may be the key factor in the achievement of set goals.¹² The following activities, which all have been in use in the OHC units of the OQN, have proven to be effective in the prevention of early retirement: (a) regular quality measurements and systematic QI initiatives,¹² (b) intensifying the treatment of depression,¹⁴ and (c) implementation of practical return-to-work policies for employees whose work ability is reduced, including work modifications such as the possibility of part-time work.^{12,24}

The activity of applying for vocational rehabilitation or disability pension was more frequent in the study population in 2015 but not any more in 2016. This can be a reflection of

the higher average age in the study population. The higher percentage of rejected applications for occupational rehabilitation in 2015 in the study population showed that the certification processes need improvement.²⁶ In 2016 the difference in rejections was not statistically significant. Vocational rehabilitation is an effective and cost-effective way to support work ability and functional ability and should therefore be promoted. Application activity should be low for disability pension but high for vocational rehabilitation to avoid early retirement. This will be one of the development areas in the OQN during the next few years.

It proved to be important to understand the trends of incident pensions before the study start. The joinpoint analyses showed that the desired changes took place the same year in both populations, or in most cases, earlier in the study population. The trend analyses of the regression coefficients showed that the full permanent pension incidence was faster decreasing in the study population during the years 2005-2010. At the same time, however, the partial permanent pension was faster increasing in the study population. A decrease also in the partial permanent pension took place after the study start which resulted in stronger change in the study population.

Affiliation to the OQN may bring added value to the development of OHC organizations and their processes, although the evidence is not strong. On the other hand, since the processes are firmly linked with each other and cannot always be studied separately, it can be challenging to determine which of them have most influenced the results and bringing in mind that the activity of employers is equally important. Employers and OHC working side by side is a necessity.

This study also showed that pension data can be used to measure the outcomes of OHC.

Our study has several strengths. The long intervention and follow-up periods are strengths of the study. A strength is also

that the study population covers municipal employees from all parts of Finland and the comparison population all other municipal employees in the country. The interpretation of our results is strengthened by the inclusion of disability pension data for several years prior to the start of the study. This allowed us to control for trends in incident pension before the study start. Such controls are recommended in Benchmarking Controlled Trials.²³

The present study has also weaknesses. Several factors, including age, gender, education, work history, activity of employers to support work ability, and regional economic factors, can influence an individual's likelihood of disability retirement.^{1,9,10} Of these factors, while depending on the permitted data, the present study was only able to control for age. However, both populations comprised of municipality workers of which a great majority works for health and social care and in education. The mean age in the study population was 0.3–0.4 years higher than in the comparison population, which has favored the control population. Due to the study setup where we did not have individual data, we were not able to settle for confounding factors.

Additionally, one should notice that changes in the Finnish society, OHC legislation, and the economic situation of the country have affected disability pension rates, although in the present study these factors influenced both populations similarly with the exception of eventual differences in unemployment figures locally.²⁷

A possible source of selection bias of our study is the affiliation of OHC units with the OQN. Participating units are likely to be more active in developing new ways of working and therefore these units might be expected to get better results. Cluster randomization could have precluded this bias²³ but performing it was not possible in our study setup. The OHC units that joined the OQN for a short period were excluded from both the study and comparison populations to avoid another bias.

Further research is needed to reinforce our findings that OHC networking can improve the outcomes of OHC. New, more effective means of collaboration and evidence of multi-domain interventions should be sought to support employees' ability to remain at work.^{12,28} Our intention in the future is to study the changes in OHC processes and their weight in outcome development.

In conclusion, our study showed that networking between OHC units including common goal setting, process development, and quality measurements improved the main outcomes; permanent disability pensions were reduced and at the same time some of the full pensions were replaced by partial pensions.

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DISCLOSURES

Approval of the research protocol: This study used only aggregated anonymous register data with no possibility to identify any individual subject. Therefore, there was no need for an ethical approval. *Informed consent:* Informed consents were given by the employers who were recruited for the study. *Registry and the Registration No. of the study/Trial:* The study protocol was approved September 22, 2017 by the Doctoral Program of Health Sciences, the Faculty of Medicine, University of Eastern Finland. Registration No: 189 067. *Animal studies:* N/A. *Conflict of interest:* Jarmo Kuronen has received grants from the Finnish Cultural Foundation (Suomen Kulttuurirahasto, Etelä-Savon Rahasto) and from Niilo Helander Foundation. Klas Winell owns a quality improvement company. Sami Riekkilä declares no conflict of interest. Jelena Hartsenko declares no conflicts of interest. Kimmo Räsänen declares no conflicts of interest.

AUTHOR CONTRIBUTIONS

Jarmo Kuronen, Klas Winell, and Kimmo Räsänen have planned the study conception and design, were responsible with Sami Riekkilä for drawing the sample from the registers of Keva and prepared the manuscript draft. Jarmo Kuronen, Klas Winell, and Jelena Hartsenko planned and carried out the statistical analyses. Kimmo Räsänen and Sami Riekkilä participated in planning the study conception, design and analyses, and commented on the manuscript draft. All authors have read and approved the final version of the manuscript to be published. All the authors participated in the agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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