

Sickness absence among Finnish special and general education teachers

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Background	Although teaching is considered a high-stress profession, research on stress-related outcomes among teachers, such as absence from work due to illness (i.e. sickness absence), remains scarce. It is possible that teachers are not a homogeneous group but include subgroups with particularly high risk of sickness absence, such as special education teachers.
Aims	To examine differences in sickness absence rates between special and general education teachers in a large cohort of 2291 Finnish lower secondary school teachers.
Methods	Register data on teachers' job titles, sociodemographic characteristics and sickness absence were obtained from 10 municipal employers' registers. Indices of sickness absence included rates of short-term (1–3 days) and long-term (>3 days) absence spells during 2003–05.
Results	With multi-level models adjusted for individual- and school-level covariates, we found that although the absolute level of sickness absence was higher among women than among men, male special education teachers were at a 1.36-fold (95% CI: 1.15–1.61) increased risk of short-term and a 1.33-fold (95% CI: 1.01–1.76) increased risk of long-term sickness absence compared with male teachers in general education. Among women, there were no differences in sickness absence between special and general education teachers.
Conclusions	Compared to male teachers in general education, male teachers in special education appear to have an excess risk of absence from work due to illness. Future studies should examine the causes for this excess risk and determine the need for preventive interventions.
Key words	Gender; health of teachers; occupational health; register data; sickness absence; teacher type.

Introduction

Teaching is considered a high-stress profession [1–5]. High levels of stress have been shown to be associated with poor self-rated health [6] and physiological problems [7] among teachers, but research on other stress-related outcomes, such as sickness absenteeism, remains scarce. Furthermore, it is possible that teachers are not a homogeneous group but include subgroups with particularly high risk of sickness absence, such as special education teachers.

Routinely collected records on medically certified sickness absence can be used as a global measure of the health of employees [8]. Research on teachers' sickness absence has demonstrated that both disadvantaged school neighbourhood and teachers' low-income area of residence

predict medically certified long-term sickness absence [9]. Teacher sickness absence has also been associated with pupils' absenteeism [10] and lower levels of pupil achievement [11].

In general, women have more sickness absence than men. It has been suggested that differences between the occupations held by the two genders explain this to a large extent [12]. As in most European countries, the USA and Australia, teaching is a female-dominated profession in Finland. Studies on teachers' well-being have shown that female teachers tend to report more stress and burnout symptoms than male teachers [1,13], but at the same time, women also experience more work engagement, defined as a positive, fulfilling work-related state of mind that is characterized by vigour, dedication

and absorption [14]. A study of German teachers found that male teachers reported more burnout symptoms, such as lack of personal accomplishment and depersonalization, than female teachers. In addition, they were less satisfied with their status as a teacher than their female colleagues [5].

The context of the study is also important when examining teachers' sickness absence. The Finnish school system, for example, requires 9 years of compulsory education, of which the last 3 are 'lower secondary school'. In Finland, special education teachers mostly work in regular schools. Special education is mainly organized according to the pull-out model, where pupils needing special education visit a special education teacher's room during certain lessons. In cases of severe learning difficulties, full-time special education is organized in special classes within the regular school or in separate special education schools. The work of a special education teacher is considered demanding and consists of teaching, background work and consultation of parents, therapists and teachers. Thus, special education teachers need good knowledge of special education and good interaction skills. Although their profession is respected and they have a slightly higher salary than that of general teachers, special education teachers often find their work exhausting [4].

Previous research has produced conflicting results on the comparisons of stress levels between special education teachers and general teachers. In some studies, stress among special educators has been lower [15], while other studies report higher stress in this group [3], and still others report that stress is at the same level in special education and general education teachers [16].

This study adds to previous evidence on teachers' health, which is largely descriptive and has been based on relatively small samples and data on self-reported outcomes. The aim of this study was to examine whether recorded sickness absence levels differ between special and general education teachers in a large sample of Finnish lower secondary school teachers.

Methods

Register data on sickness absence and teacher and school characteristics were extracted as a part of the Finnish Public Sector Study (the 10-Town Study) [9,17], which focuses on the health of local government personnel, including school teachers. The study was approved by the Ethics Committee of the Finnish Institute of Occupational Health. Our data consists of sickness absence records from registers on all the lower secondary school teachers ($N = 2291$) that were employed in 90 lower secondary schools in 10 municipalities during 2003–05. Of the sample, 2080 (91%) were general teachers and 211 (9%) were special education teachers.

Data on sickness absence during a 3-year time window (2003–05) were obtained from employers' registers. We followed standard procedures to construct two separate measures of sickness absence for each teacher: the number of short-term (1–3 days) and long-term absence spells (>3 days) [18]. In the target organizations, all sickness absence certificates, irrespective of where they are issued, must be forwarded to employer for recording. For periods of up to 3 days, employees complete their own certificates. For absences >3 days, medical certificates are required. We calculated the number of contracted days for each teacher, representing 'days at risk' (when a teacher was assumed to work), from which the number of days absent from work for reasons other than sickness was subtracted.

Data with regard to teacher type (special/general education teacher), age and sex and employment contract (temporary/permanent) were obtained from employers' registers for the year 2004. Records from employers' registers allowed us to control for some school-level characteristics in 2004 using school codes. School size (total working hours expressed as person-years), staff turnover rate [$1 - (\text{total working hours}/\text{total number of personnel during 2004})$] and average level of income of school neighbourhood were used as school-level covariates in the statistical models.

Because individual teachers were nested in schools, we used a multi-level data structure with teacher type variable (special/general) at the second level (SAS GLIMMIX Procedure). We used Poisson regression models to examine the risk of sick leave and to estimate the rate ratios (RRs) with their 95% confidence intervals for teacher type. We also estimated the variance components (random effects) of sick leave in all models to take into account the school-level variance. The median mean ratio (MMR) was calculated to translate the school-level variance in the odds ratio (OR) scale. MMR quantifies the variation between clusters (the second-level variation) by comparing two persons from two randomly chosen different clusters [19]. MMR is always ≥ 1 . If it is 1, there is no second-level variation.

For a two-sided test and assuming a significance level of 5%, we had 99% power to detect a 30% of difference in short-term sickness absence between special education and general education teachers. The corresponding power in long-term sickness absence was 98% [20].

All statistical analyses were performed using SAS 9.2 (SAS Institute, Cary, NC, USA).

Results

Of the teachers, 72% were women and 28% were men, 77% had a permanent and 23% a fixed term job contract. The mean age of teachers in the study group was 46.7 (SD = 9.8). Table 1 shows the individual- and school-level characteristics of general and special education teachers stratified by sex. There were more male teachers in special

Table 1. Characteristics of general and special education teachers by sex

	Total			Women			Men		
	General teachers (<i>n</i> = 2080)	Special education teachers (<i>n</i> = 211)	<i>P</i> -value ^a	General teachers (<i>n</i> = 1508)	Special education teachers (<i>n</i> = 137)	<i>P</i> -value	General teachers (<i>n</i> = 572)	Special education teachers (<i>n</i> = 74)	<i>P</i> -value ^a
Teacher-level characteristics									
Gender, <i>n</i> (%)									
Male	572 (28)	74 (35)							
Female	1508 (72)	137 (65)	<0.05	–	–	–	–	–	–
Type of employment contract, <i>n</i> (%)									
Permanent	1612 (78)	159 (75)		1187 (79)	107 (78)		425 (74)	52 (70)	
Temporary	468 (22)	52 (25)	n.s.	321 (21)	30 (22)	n.s.	147 (26)	22 (30)	n.s.
Mean age (SD)	47 (10)	46 (8)	n.s.	47 (10)	46 (9)	n.s.	45 (10)	47 (8)	n.s.
School-level characteristics									
School size (person-years in 2004), mean (SD)	35 (11)	34 (12)	n.s.	35 (11)	34 (13)	n.s.	35 (11)	35 (11)	n.s.
Staff turnover percentage, mean (SD)	31 (17)	32 (15)	n.s.	31 (17)	33 (15)	n.s.	33 (17)	29 (15)	n.s.
Average income level (per year) of school neighbourhood (€), mean (SD)	22 873 (9414)	22 047 (3766)	<0.05	22 969 (4978)	22 003 (4247)	<0.05	22 619 (4737)	22 130 (2680)	n.s.

^aThe *P*-value refers to the statistical significance of the difference between general and special education teachers, n.s. = non-significant, *P* > 0.05.

education than in general education. In addition, female special education teachers worked more often in schools located in neighbourhoods of lower resident income level. There were no differences between special and general education with regard to teachers' mean age, type of job contract, school size or staff turnover rate.

The overall rate of short-term (1–3 days) sickness absence was 1.1 spells per person-year and the overall rate of long-term (>3 days) sickness absence was 0.4 spells per person-year. We found a borderline significant (*P* < 0.06) interaction between teacher type and sex with regard to short-term sickness absence and therefore performed further analyses separately for men and women. Male general education teachers had the fewest absences; on average, 0.8 short-term absences and 0.3 long-term absences per person-year. The corresponding figures for male special education teachers were 1.3 and 0.4, respectively. Female special education teachers had the most absences; on average, 1.6 short spells and 0.5 long spells per person-year. The corresponding figures for female general education teachers were 1.2 short and 0.4 long spells.

Poisson regression analysis showed that women had more short-term (RR = 1.33, 95% CI: 1.23–1.45) and long-term (RR = 1.40, 95% CI: 1.22–1.61) sickness absence than male teachers. Analysis of the association in men and women combined revealed that special education teachers had slightly more short-term (RR = 1.15, 95% CI: 1.04–1.26) and long-term (RR = 1.20 95%

CI: 1.02–1.40) sickness absence than teachers in general education. When analysing differences in sickness absence stratified by sex, we found that short-term sickness absences were more common among male special education teachers than among men in general education (RR = 1.22, 95% CI: 1.05–1.41).

Table 2 presents the results from the Poisson regression analyses showing both unadjusted and adjusted associations between teacher type and number of short-term sick leave spells during a 3-year period among women and men. Among women, there was no difference in the amount of sickness absence between special and general education teachers (RR = 1.05, 95% CI: 0.95–1.17). Of the covariates, older age (*F* = 86.8, *P* < 0.001) was the only significant predictor of women's short-term sickness absence. The school-level variance in short-term sickness absence among women decreased by 7% (variance 0.192 versus 0.178) after including both teacher- and school-level variables in the model. The 1.52 school-level MMR of women's short-term sickness absence was moderate in size. These results suggest that differences in female teachers' short-term sickness absence between schools were to a large extent explained by factors other than those included in our models.

In the final model, male special education teachers were at a 1.36-fold (95% CI; 1.15–1.61) increased risk of short-term sickness absence compared to male general teachers. Along with teacher type (*F* = 14.2, *P* < 0.001), older age

Table 2. Associations between teacher type and number of short-term (1–3 days) sick leave spells among women and men

	Teachers' short-term sickness absence							
	Empty model	Unadjusted model		Model I ^a		Model II ^b		
	RR (95% CI)	<i>P</i> -value	RR (95% CI)	<i>P</i> -value	RR (95% CI)	<i>P</i> -value	RR (95% CI)	<i>P</i> -value
Female teachers								
General education (<i>n</i> = 1508)			Referent		Referent		Referent	
Special education (<i>n</i> = 137)			1.05 (0.95–1.17)	n.s.	1.05 (0.95–1.17)	n.s.	1.05 (0.95–1.17)	n.s.
Random effects							0.178 (0.030)	
School variance (SE)	0.192 (0.032)	<0.001	0.191 (0.032)	<0.001	0.185 (0.031)	<0.001		<0.001
School MMR	1.52		1.52		1.51		1.50	
Male teachers								
General education (<i>n</i> = 572)			Referent		Referent		Referent	
Special education (<i>n</i> = 74)			1.35 (1.14–1.60)	<0.001	1.35 (1.14–1.59)	<0.001	1.36 (1.15–1.61)	<0.001
Random effects								
School variance (SE)	0.331 (0.064)	<0.001	0.318 (0.062)	<0.001	0.287 (0.057)	<0.001	0.263 (0.053)	<0.001
School MMR	1.73		1.71		1.67		1.63	

n.s., non-significant, $P > 0.05$.

^aAdjusted for teachers' age and employment contract.

^bAdjusted as Model I + school-level variables (school size, staff turnover ratio and average income level of school neighbourhood).

($F = 19.6$, $P < 0.001$) and higher average level of income of the school neighbourhood ($F = 7.8$, $P < 0.01$) were significant predictors of short-term sickness absence among men. The school-level variance in short-term sickness absence among men decreased by 13% (variance 0.331 versus 0.287) when individual-level covariates were included. School-level variance decreased by 21% (variance 0.331 versus 0.263) when both teacher- and school-level variables were added to the model. The 1.73 school-level MMR of short-term sickness absence was rather large in size. The MMR decreased to 1.63 in the model adjusted for teacher type and individual- and school-level covariates, still remaining statistically significant and rather large in size (Table 2). This suggests that differences in male teachers' short-term sickness absence between schools were mostly explained by teacher individual characteristics, but school-level characteristics also were significant predictors. However, the school-level variance in male teachers' short-term sickness absence still remained significant after all our predictors were included.

The unadjusted and adjusted associations between teacher type and number of long-term sickness absences during a 3-year period among men and women are shown in Table 3. Among women, teacher type was not statistically significantly associated with long-term sickness absence (RR = 1.14, 95% CI: 0.97–1.34). Moreover, none of the covariates were associated with women's long-term sickness absence. Male special education teachers were at a 1.33-fold (95% CI: 1.01–1.76) increased risk of long-term sickness absence compared with their general teacher colleagues after adjustment for individual- and

school-level covariates. Teacher type was the only significant predictor of teachers' long-term sickness absence among men.

The school-level variance in long-term sickness absence among women decreased by 11% (variance 0.128 versus 0.114) when both teacher- and school-level variables were added to the model. The 1.41 school-level MMR of long-term sickness absence was statistically significant and moderate in size. The MMR decreased to 1.38 in the model adjusted for teacher type and individual- and school-level covariates. The school-level variance in long-term sickness absence among men decreased by 5% (variance 0.218 versus 0.208) when teacher type was added to the model. Further adjustment for individual-level covariates did not change school-level variance of long-term sickness absence among men. After adjustment for both teacher- and school-level variables, the school-level variance actually increased slightly when compared to the unadjusted model (variance 0.208 versus 0.215). The 1.56 school-level MMR of long-term sickness absence among men was moderate in size. In other words, differences in both female and male teachers' long-term sickness absence between schools were to a large extent explained by factors other than those included in our models (Table 3).

As a subsidiary analysis, we repeated the analysis with total number of days absent due to illness during 2003–05 as the outcome (data not shown). Results were similar to those with absence spells as the outcome variable. On average, teachers were absent during the study period for 25 days (SD = 43, range 0–517). With multi-level negative

Table 3. Associations between teacher type and number of long-term (>3 days) sick leave spells among women and men

	Teachers' long-term sickness absence							
	Empty model		Unadjusted model		Model I ^a		Model II ^b	
	RR (95% CI)	<i>P</i> -value	RR (95% CI)	<i>P</i> -value	RR (95% CI)	<i>P</i> -value	RR (95% CI)	<i>P</i> -value
Female teachers								
General education (<i>n</i> = 1508)			Referent		Referent		Referent	
Special education (<i>n</i> = 137)			1.14 (0.97–1.34)	n.s.	1.14 (0.97–1.34)	n.s.	1.14 (0.97–1.34)	n.s.
Random effects								
School variance (SE)	0.128 (0.026)	<0.001	0.125 (0.027)	<0.001	0.122 (0.026)	<0.001	0.114 (0.026)	<0.001
School MMR	1.41		1.40		1.40		1.38	
Male teachers								
General education (<i>n</i> = 572)			Referent		Referent		Referent	
Special education (<i>n</i> = 74)			1.34 (1.03–1.74)	<0.05	1.33 (1.02–1.74)	<0.05	1.33 (1.01–1.76)	<0.05
Random effects								
School variance (SE)	0.218 (0.057)	<0.001	0.208 (0.056)	<0.001	0.206 (0.056)	<0.001	0.215 (0.059)	<0.001
School MMR	1.56		1.55		1.54		1.56	

n.s., non-significant, $P > 0.05$.

^aAdjusted for teachers' age and employment contract.

^bAdjusted as Model I + school variables (school size, turnover ratio and average income level of school neighbourhood).

binomial regression analysis, we found that among women, there was no association between teacher type and the number of days absent due to illness (RR = 1.11, 95% CI: 0.83–1.48). In the final model adjusted for teacher- and school-level covariates, male special education teachers were at a 1.62-fold (95% CI: 1.04–2.52, $P < 0.05$) increased risk of sickness absenteeism compared to male teachers in general education.

Discussion

We found that special education teachers had more sickness absence than teachers in general education. This relationship was obvious only among men; teacher type was not associated with sickness absence among women. Among men, special education teachers were at >30% higher risk of both short- and long-term sickness absence spells than general education teachers. When studying days absent due to illness as the outcome, male special education teachers were at ~60% higher risk of sickness absenteeism. Our findings were based on multi-level modelling taking into account the hierarchical structure of the dataset (teachers nested in schools) and the skewed distribution of sickness absence data. This is to our knowledge the first study examining recorded sickness absenteeism among general and special education teachers. With a large cohort of teachers and objective data from employers' registers, we were able to compare sickness absence between special education teachers and teachers in general education.

In accordance with earlier research on sickness absence [12], we found that female teachers had more sickness ab-

sence than male teachers. Our finding that higher school neighbourhood income level was associated with the short-term sickness absence of male teachers differed slightly from previous studies in which lower school neighbourhood income level has been associated with a number of chronic diseases, health behaviour, work environment [21] and long-term sickness absence among teachers [9]. This may be due to the fact that short-term absence is not as good as a measure of ill-health as long-term (medically certified) absence [8].

Because this study was based completely on register data, the reasons for the observed differences in teachers' sickness absence levels are not known. The observed difference between special and general education teachers may reflect different underlying causes and related health risk behaviours, which may be more prevalent among male special education teachers. Higher stress may contribute to stress-related illnesses that require sickness absence [8]. Furthermore, it is possible that the stressful work environment in special education increases non-attendance and health risk behaviours. Past research has demonstrated, for example, that a stressful work environment is associated with smoking and higher body mass index [22,23].

A further plausible explanation for male special teachers' sickness absence may be violent incidents at school. Special education teachers are at risk of being exposed to pupil violence; pupils placed in special education had higher prevalence rates in violence as well as in other delinquent behaviour [24]. Male special education teachers may find themselves in violent situations even more often than their female colleagues, which increases their work

strain and ill-health, including sickness absence due to physical or mental assaults.

Except for male teachers' short-term sickness absence, the school-level variance of teachers' sickness absence was rather stable and did not change a great deal when individual- and school-level variables were added to the models. This indicates that the differences in teachers' sickness absence between schools are to a large extent explained by factors other than those included in our models. Studies conducted in Australia [25] and Israel [26,27] suggest that teachers' absenteeism may also represent shirking behaviour and school-level absence behaviour.

This study has several limitations. First, we were not able to control for possible mechanisms explaining the observed difference between male special education and general education teachers, such as increased morbidity, health risk behaviours and exposure to violent incidents. These issues need to be explored in detail in future studies. A further possible mechanism relates to the psychosocial work environment of schools and classrooms. Psychosocial factors at work, such as excessive job demands and lack of job control, have been found to be associated with sickness absenteeism [28] and with the health of teachers. For example, a Greek study showed that high scores in interpersonal conflict at work were associated with self-rated illness symptoms among special education teachers [29]. Several other studies have found associations of self-reported low flexibility, low autonomy, low social support, restrictive leadership at school and low commitment to school with the health of general education teachers [5,13,21,26,27,30].

Another limitation is that we were not able to control for teacher qualifications, which may also be a moderating factor explaining why we found an association only among men. Due to a severe shortage of male special education teachers in Finland, it is possible that these teachers are, in terms of formal education, less qualified compared with corresponding women. This can further increase work stress and lead to, for example, ineffective ways of coping with difficulties in interaction with pupils in the classroom. However, pre-existing health problems may also play a role in explaining the excess sickness absence risk among male special education teachers and we were not able to control for health selection in our study.

This study may have important practical conclusions. By showing an elevated sickness absence rate in male special education teachers, this study suggests that among teachers, there may be a subgroup—male teachers in special education—in need for more effective interventions to reduce sickness absence. However, further research on their health and other plausible mechanisms explaining the excess sickness absence in special education teachers is needed to determine the content and feasibility of these interventions.

Key points

- Research on absence from work due to illness among teachers has not previously focused on potential at-risk subgroups, such as special education teachers.
- In a multi-level setting, this study showed that although women had more sickness absences than men, there was an excess risk for sickness absence among male special education teachers compared to their male colleagues in general education.
- Future studies should focus on the mechanisms explaining the observed difference.

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Conflicts of interest

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