


BMJ Open Level of education and sustainable return to work among long-term sick-listed workers with depression: a register-based cohort study (The Norwegian GP-DEP Study)

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To cite: Meling HM, Ruths S, Baste V, *et al*. Level of education and sustainable return to work among long-term sick-listed workers with depression: a register-based cohort study (The Norwegian GP-DEP Study). *BMJ Open* 2023;**13**:e072051. doi:10.1136/bmjopen-2023-072051

► Prepublication history for this paper is available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2023-072051>).

Received 22 January 2023
Accepted 21 June 2023



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ABSTRACT

Objectives Sick-listed workers with depression are at higher risk of long-term, recurrent sickness absence and work disability, suggesting reduced likelihood of sustainable return to work (SRTW). Though likelihood of RTW has been associated with education level, less is known about the association over time, post-RTW. We aimed to investigate associations between educational level and SRTW among long-term sick-listed workers with depression.

Methods Nationwide cohort study, based on linked data from Norwegian health and population registries, including all inhabitants of Norway aged 20–64 years on long-term sick leave with a depression diagnosis given in general practice between 1 January 2009 and 10 April 2011 (n=13.624, 63.7% women). Exposure was the highest attained education level (five groups). Three outcome measures for SRTW were used, with 0 days, ≤30 days and ≤90 days of accumulated sickness absence post-RTW during a 2-year follow-up. Associations between exposure and outcomes were estimated in gender-stratified generalised linear models, adjusting for sociodemographic factors and duration of sick leave.

Results Higher-educated workers had a higher likelihood of SRTW 0, SRTW ≤30 and SRTW ≤90 than the lowest-educated groups in the crude models. Among men, this association was mainly explained when adjusting for occupation. Among women, the highest educated group had a higher likelihood of SRTW 0 (RR=1.45, 95% CI 1.23 to 1.71) and SRTW ≤30 and SRTW ≤90 in the fully adjusted models.

Conclusions An educational gradient in SRTW was mainly explained by occupation among men but not among women. These findings suggest gendered differences in associations between education level and SRTW, which could inform interventions aiming to promote equal opportunities for SRTW.

BACKGROUND

Workers with common mental disorders (CMDs) like depression are at higher risk of work disability and long-term and recurrent

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ We used linked data from high-quality national health- and administrative registers comprising a large study sample (13,624).
- ⇒ The participants were followed for 2 years after return to work, prolonging the follow-up time compared with other studies investigating sustainability in return to work.
- ⇒ We had no information on severity of depression or graded sick leave.
- ⇒ The study results may be transferable to countries with universal health and welfare systems similar to the Norwegian system but are less likely transferable to countries with privatised systems.
- ⇒ This study was based on measurable information available in the registries, meaning it cannot illuminate the important qualitative aspects of sustainability in return to work.

sickness absence,^{1–3} indicating a lower likelihood of sustainable return to work (SRTW) for that segment of the working population.⁴ Research on sick-listed workers with CMDs describes common barriers to RTW, such as job strain, comorbidity, previous sickness absence, higher age and low education,^{5–7} while factors such as positive RTW expectation, self-efficacy, high work ability, job control, decision control, and higher education seemingly facilitate RTW.^{5 7 8} However, knowledge about what factors may impact whether these workers remain in work post-RTW, that is, SRTW, is scarce.

A recent systematic review on SRTW among workers with musculoskeletal disorders and CMDs highlighted SRTW as a complex, multi-level concept;⁹ consistent evidence of predictors for SRTW spanned from personal characteristics (eg, self-efficacy) to work-related factors (eg, support from managers)

and sociodemographic aspects (eg, higher education). Many studies investigating SRTW operate with a 1–3 month follow-up period post-RTW.⁹ Though 1.5–3 years post-RTW has been suggested as a critical observational period,¹⁰ there is currently no consensus regarding what time span is sufficient to ascertain SRTW. Moreover, how much sickness absence post-RWT could reasonably be considered ‘sustainable’ for a working population at risk for recurrent sickness absence is rarely addressed.¹¹ Therefore, studies with prolonged follow-up post-RTW, taking subsequent sickness absence into account, are warranted.

Level of education seemingly influences the likelihood of RTW and SRTW. However, little is known about associations between education level and SRTW after long-term sickness absence among men and women with depression when studying them separately and over time. Such knowledge could help inform stakeholders in SRTW processes. Education is a central component of peoples’ socioeconomic position, and studies demonstrate a social gradient in depression and all-cause sickness absence.^{12 13} Education also functions as a gateway to occupations, and people in occupations with poor working conditions and low job control have a higher likelihood of sickness absence and longer time to RTW.¹⁴ Societal factors, such as gender-segregated working life, may influence all-cause sickness absence for men and women in different ways. Findings indicate that female-dominated occupations entail less physically compromising working conditions than male-dominated ones,¹⁵ suggesting a more advantageous labour market for women.¹⁶ However, female-dominated occupations (ie, human service occupations) often involve a higher burden of care and emotional labour, which is also associated with sickness absence.¹⁷ In sum, factors related to sickness absence, which can act as barriers to SRTW, seem to vary by gender, suggesting a gender-stratified approach fruitful when investigating SRTW.

In 2013, OECD published a report showing that Norway had the highest rate of sickness absence in the OECD area with 7% of the working population being on sick leave at any time, almost twice the rate of other Nordic countries with similar health and welfare systems.¹⁸ Since then, sickness absence has decreased to 5.4%, as per the 2022 report from the Norwegian Labour and Welfare Administration. Still, the report states that 22% of total sickness absence is due to mental illness (25% among women and 19% among men), and that mental illness is the cause of the longest sick leave spells, with an average of 73.9 days.¹⁹ Considering these trends, generating knowledge about factors relating to SRTW after long-term sickness absence due to depression is of considerable urgency.

Aim

This study aimed to examine the association between education level and three SRTW measures during a 2-year follow-up of men and women after long-term sick leave with depression. We also examined how sociodemographic

variables, occupational category and length of sick leave influenced the association.

METHODS

Setting

About 99% of the Norwegian population has a designated general practitioner (GP) as a part of the universal healthcare system.²⁰ GPs are gatekeepers to publicly funded health-related social welfare schemes, such as sickness benefits, work assessment allowance and disability and retirement pensions. In Norway, full or partial sick leave with sick pay (full income coverage) can last up to 365 days; the employer covers the first 16 days of sick pay, and the Norwegian Labour and Welfare Administration covers day 17 up to day 365. If a person’s work capacity is too diminished to return to work after 365 days of sick leave, they are transferred to work assessment allowance or disability pension.²¹

Study design

The Norwegian GP-DEP Study is a registry-based cohort study investigating integrated and equitable pathways of depression care in general practice.²² The cohort is closed and includes all residents of Norway who were 12 years or older before 1 January 1996 (4 017 989 individuals). The study sample is a cohort of workers on certified long-term sick leave with a depression diagnosis in primary care drawn from the Norwegian GP-DEP Study cohort.

DATA SOURCES

Data from five national health, welfare and population registries were linked at the individual level using the unique personal identity number (encrypted) assigned to all Norwegian residents. We retrieved data regarding the year of birth and death, gender, emigration, income, marital status, urbanity and occupational group from the ‘National Population Register’. Data on depression diagnosis (P76) was retrieved from ‘The Control and Reimbursement of Healthcare Claims’ (KUHR), which holds data on all claims for fee-for-service from GPs, including reimbursement code(s) for diagnostic and therapeutic measures, and diagnoses coded according to the International Classification of Primary Care, 2nd version (ICPC-2). Information on start and end dates for issued social welfare benefits, such as sick pay covered by the Norwegian Labour and Welfare Administration during sick leave, work assessment allowance, disability pension and retirement pension, were provided by the ‘Norwegian Social Insurance Database’. Lastly, we obtained information about individuals’ highest level of completed education from the ‘National Education Database’. The Norwegian Directorate of Health administers the KUHR database, and the remaining databases are administered by Statistics Norway.²³ All data were stored and analysed at a safe server at the University of Bergen.

Study population

The study population included all individuals aged 20–64 years who, in the period between 1 January 2009 and 10 April 2011 had (1) a depression diagnosis recorded in primary care (P76 in the ICPC-2) and (2) onset of long-term sickness absence, defined as a sick leave spell lasting a minimum of 3 consecutive months (≥ 90 days) (N=14 042). The inclusion period was set to ensure complete data for all participants through the study period. The sick leave spell could last a maximum of 365 days and was identified via registered start and end dates of issued sick pay. In Norway, sickness absence ≥ 8 weeks is commonly referred to as long-term sickness absence, however, there is no agreed-on definition. Considering that mental illness, on a national average, causes the longest sickness absence spells at 73.9 days¹⁹, we chose to define long-term sickness absence as ≥ 90 days, as in other recent studies.^{24,25}

We excluded participants receiving work assessment allowance, disability pension or early retirement pension during the sick leave spell (n=292). We also excluded individuals who died (n=103, 0.75%) or emigrated (n=81, 0.59%) during follow-up which lasted 2 years from the registered end date of sick pay. The end date of follow-up was 10 April 2014. The final study population comprised 13 624 individuals, of which 63.7% were women.

Outcomes

We constructed three outcome measures of SRTW based on accumulated all-cause sickness absence days registered in the 'Norwegian Social Insurance Database' after RTW during the 2-year follow-up (730 days). The SRTW variables represented three different cut-offs for accumulated sickness absence: SRTW(0)=1 included those with no sickness absence, SRTW(≤ 30)=1 included those with 0–30 registered sickness absence days and SRTW(≤ 90)=1 included those with 0–90 registered sickness absence days. The variables would equal 0 for all other participants and those receiving work assessment allowance, disability pension or retirement pension during follow-up. We constructed the SRTW outcomes reasoning that a working population with depression and an elevated risk of recurrent sickness absence¹ may require allowance for some absence post-RTW for their RTW to be sustainable.¹¹ Different cut-offs for accumulated sickness absence were discussed and tested (0 day, ≤ 30 days, ≤ 60 days, ≤ 90 days, ≤ 120 days and ≤ 150 days). After conferring with colleagues experienced in clinical general practice and general practice research, we decided on 0-day, ≤ 30 -day and ≤ 90 -day cut-offs, as they sufficed to show the educational gradient we observed, and could arguably be considered sustainable.

Exposure

Exposure was the highest level of completed education in the Norwegian Standard Classification of Education (NUS). We recoded 10 NUS groups into 5 groups, corresponding to the International Standard Classification of Education (ISCED 2011)²⁶: ≤ 10 th grade (ISCED 0–2, pre-primary to lower secondary education); high school

dropout (subcategory of ISCED 2, lower secondary education plus the first year of upper secondary education); high school graduate (ISCED 3–4, upper secondary and post-secondary non-tertiary education); college/university (low) (ISCED 5–6, first stages of tertiary education) and college/university (high) (ISCED 7–8, second stage of tertiary education).

Covariates

Age was recoded into five categories (20–29 years, 30–39 years, 40–49 years, 50–59 years and 60–64 years). Marital status was categorised into three categories (married/registered partner, single/no registered partner and divorced/separated/widowed). Income level was categorised into 3 categories (low=€16 800, medium=€16 801–33 600, medium high/high= \geq €33 601. Norwegian kroner (NOK) converted to € according to 11 May 2023 currency conversion rates). Urbanity indicates the urbanity of participants' municipality of residence, a measure based on a standard classification index of centrality with six categories describing their location in relation to urban settlements of various sizes.²⁷ We recoded those six categories into four (1, 2=urban, 3=town, 4=rural and 5, 6=remote). Occupational category was based on the International Standard Classification of Occupations structure (ISCO-08) and categorised as 'skilled labour and manual work' (skilled agricultural, forestry and fishery workers, craft and related trade workers, plant and machine operators, assemblers and elementary occupations), 'clerical, service and sales work' (clerical support workers and service and sales workers) and 'managerial, academic and technical work' (technicians and associate professionals, professionals, managers and armed forces occupations). Duration of sick leave spell was recoded into 3 categories based on days of consecutive sick leave (≤ 6 months (1–180 days), 6–9 months (181–270 days) and 9–12 months (271–365 days)).

Statistical analysis

All analyses were performed for men and women separately. We used descriptive statistics to examine the distribution of demographic and socioeconomic characteristics and duration of sick leave spell (n (%), total and for men and women).

We used multivariable Poisson regression with robust variance estimates due to problems with convergence in log-binomial regression²⁸ to estimate relative risk (RR) with 95% CIs for SRTW in the education level groups. The lowest educated group (≤ 10 th grade) was the reference group. Four hierarchical models are presented; model 1 (crude); model 2 (includes age, marital status, urbanity and income); model 3 (adding occupational category to model 2) and model 4 (adding duration of sick leave spell to model 3).

Due to missing occupational data (see table 1), we performed a sensitivity analysis excluding those with missing occupational data in regression models 1 and 2 and compared the results with the original models 1 and 2. For all statistical analyses, we used $\alpha=0.05$ as the

**Table 1** Characteristics of 13 624 long-term sick listed workers with depression in Norway, 1 January 2009–10 April 2011

	Total	Men	Women
	n (%)	n (%)	n (%)
	13 624	4951 (36.3)	8673 (63.7)
Age group (years)			
20–29	2077 (15.3)	659 (13.3)	1418 (16.4)
30–39	3849 (28.3)	1283 (25.9)	2566 (29.6)
40–49	3882 (28.5)	1454 (29.4)	2428 (28.0)
50–59	2889 (21.2)	1172 (23.7)	1717 (19.8)
60–64	927 (6.8)	383 (7.7)	544 (6.3)
Education level			
≤10th grade	3038 (22.3)	1314 (26.5)	1724 (19.9)
High school (dropout)	1420 (10.4)	521 (10.5)	899 (10.4)
High school (graduated)	4441 (32.6)	1794 (36.2)	2647 (30.5)
College/university (low)	3785 (27.8)	943 (19.1)	2842 (32.8)
College/university (high)	808 (5.9)	317 (6.4)	491 (5.7)
Missing	132 (1.0)	62 (1.3)	70 (0.8)
Income level*			
Low	1451 (10.7)	373 (7.5)	1078 (12.4)
Medium	7633 (56.0)	2231 (45.1)	5402 (62.3)
Medium high/high	4534 (33.3)	2342 (47.3)	2192 (25.3)
Missing	6 (0.0)	5 (0.1)	1 (0.0)
Marital status†			
Married/registered partner	5614 (41.2)	2096 (42.3)	3518 (40.6)
Single/no registered partner	5151 (37.8)	1942 (39.2)	3209 (37.0)
Divorced/separated/widowed	2853 (20.9)	909 (18.4)	1944 (22.4)
Missing	6 (0.0)	4 (0.1)	2 (0.0)
Urbanity‡			
Urban	5836 (42.8)	2047 (41.4)	3789 (43.7)
Town	3962 (29.1)	1456 (29.4)	2506 (28.9)
Rural	2460 (18.1)	953 (19.3)	1507 (17.4)
Remote	1361 (10.0)	492 (9.9)	869 (10.0)
Missing	5 (0.0)	3 (0.1)	2 (0.0)
Occupational category§			
Skilled labour and manual work	1977 (14.5)	1423 (28.7)	554 (6.4)
Clerical, service and sales work	4767 (35.0)	967 (19.5)	3800 (43.8)
Managerial, academic and technical work	5575 (40.9)	1863 (37.6)	3712 (42.8)
Missing	1305 (9.6)	698 (14.1)	607 (7.0)
Duration of sick leave spell¶			
1–180 days (6 months)	5381 (39.5)	1899 (38.4)	3482 (40.2)
181–270 days (>6–9 months)	2470 (18.1)	860 (17.4)	1610 (18.6)
271–365 days (>9–12 months)	5773 (42.4)	2192 (44.3)	3581 (41.3)

*Low=€16 800, medium=€16 801–33 600, medium high/high=≥€33 601. NOK converted to € according to currency conversion rates per 11 May 2023.

†The category single/no registered partner does not necessarily mean these individuals are not co-habitant.

‡Index of centrality based on municipal proximity to urban settlements (ie, workplaces and service functions).

§Based on the ISCO-08 structure, categorised as 'Skilled labour and manual work'=skilled agricultural, forestry and fishery workers, craft and related trade workers, plant and machine operators, assemblers and elementary occupations, 'Clerical, service, and sales work'=clerical support workers and service and sales workers and 'Managerial, academic and technical work'=technicians and associate professionals, professionals, managers and armed forces occupations.

¶Consecutive days of sick leave spell presented in 3-month intervals. NB! Individuals were included in the study population at the point of 3 months consecutive index sick leave (90 days).

ISCO-08, International Standard Classification of Occupation; NOK, Norwegian kroner.

significance level. We analysed the data using STATA/SE V.17.0 for Windows.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research. However, the project of which this study is a part, the Norwegian GP-DEP Study, consulted a user group consisting of representatives from the patient organisation Mental Helse, relevant healthcare professions, municipal officials and the Norwegian Labour and Welfare Administration.

RESULTS

Study population characteristics

Among men, 36.2% had a high school degree, and 25.5% had a lower or higher college/university education (table 1). Moreover, 47.3% of the men had a medium-high to high-income level. Managerial, academic and

technical work (37.6%) and skilled labour and manual work (28.7%) were the two largest occupational categories. For 44.3% of the men, the sick leave spell lasted between 9 months and 12 months.

Among women, the largest educational group had a lower college/university education (32.8%), and the majority (62.3%) had a medium income. The largest occupational categories were clerical, service and sales work (43.8%) and managerial, academic and technical work (42.8). For 41.3% of the women, the sick leave spell lasted between 9 months and 12 months (table 1). The proportion of workers achieving SRTW 0, SRTW ≤ 30 and SRTW ≤ 90 increased by education levels (tables 2 and 3).

Likelihood of SRTW across education levels

Among men, we found an increased likelihood of SRTW, with 0, ≤ 30 and ≤ 90 accumulated days of sickness absence, with increased educational level (table 2, model 1). After adjusting for sociodemographic variables, this

Table 2 RRs of SRTW during 2-year follow-up allowing for 0 days, ≤ 30 days and ≤ 90 days accumulated sickness absence by education level groups, among men

	SRTW* %	Model 1	Model 2	Model 3	Model 4
		Crude (n=4889)	+ age, marital status, centrality, and income (n=4881)	+ occupational category (n=4198)	+ duration of sick leave spell (n=4198)
		RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)
SRTW(0)†					
Education					
≤ 10 th grade	29	1	1	1	1
High school (dropout)	29	1.02 (0.87 to 1.19)	1.07 (0.91 to 1.26)	1.02 (0.86 to 1.22)	1.01 (0.85 to 1.20)
High school (graduated)	34	1.19 (1.07 to 1.33)	1.16 (1.04 to 1.30)	1.12 (1.00 to 1.26)	1.11 (0.99 to 1.24)
College/university (low)	36	1.25 (1.11 to 1.41)	1.22 (1.07 to 1.38)	1.08 (0.94 to 1.24)	1.06 (0.92 to 1.22)
College/university (high)	43	1.51 (1.29 to 1.75)	1.43 (1.22 to 1.68)	1.24 (1.04 to 1.48)	1.19 (1.00 to 1.41)
SRTW(≤ 30)‡					
Education					
≤ 10 th grade	33	1	1	1	1
High school (dropout)	33	0.98 (0.84 to 1.13)	1.05 (0.90 to 1.22)	1.02 (0.87 to 1.20)	1.01 (0.86 to 1.17)
High school (graduated)	38	1.14 (1.04 to 1.26)	1.12 (1.02 to 1.24)	1.10 (0.99 to 1.22)	1.08 (0.98 to 1.19)
College/university (low)	40	1.19 (1.06 to 1.32)	1.17 (1.05 to 1.32)	1.07 (0.94 to 1.21)	1.05 (0.92 to 1.19)
College/university (high)	47	1.41 (1.22 to 1.62)	1.36 (1.18 to 1.57)	1.22 (1.04 to 1.43)	1.16 (0.99 to 1.36)
SRTW(≤ 90)§					
Education					
≤ 10 th grade	42	1	1	1	1
High school (dropout)	41	0.99 (0.88 to 1.12)	1.05 (0.93 to 1.19)	1.02 (0.90 to 1.16)	1.01 (0.90 to 1.14)
High school (graduated)	47	1.14 (1.05 to 1.23)	1.10 (1.02 to 1.20)	1.07 (0.99 to 1.17)	1.05 (0.97 to 1.14)
College/university (low)	48	1.16 (1.05 to 1.27)	1.13 (1.03 to 1.24)	1.04 (0.94 to 1.16)	1.02 (0.93 to 1.13)
College/university (high)	52	1.26 (1.12 to 1.43)	1.21 (1.07 to 1.38)	1.11 (0.97 to 1.27)	1.06 (0.92 to 1.21)

*Proportion of participants attaining the respective SRTW outcome for each educational level.

†Full RTW with no registered sickness absence days during 2-year follow-up.

‡Full RTW with up to 30 accumulated registered sickness absence days during 2-year follow-up.

§Full RTW with up to 90 accumulated registered sickness absence days during 2-year follow-up.

RRs, relative risks; RTW, return to work; SRTW, sustainable return to work.



Table 3 RRs of SRTW during 2-year follow-up allowing for 0 days, ≤ 30 days and ≤ 90 days accumulated sickness absence by education level groups, among women

SRTW*	%	Model 1	Model 2	Model 3	Model 4
		Crude (n=8603)	+ age, marital status, centrality, and income (n=8600)	+ occupational category (n=8006)	+duration of sick leave spell (n=8006)
		RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)
SRTW(0)†					
Education					
≤ 10 th grade	23	1	1	1	1
High school (dropout)	27	1.17 (1.02 to 1.35)	1.15 (0.99–1.33)	1.10 (0.95–1.28)	1.09 (0.94–1.27)
High school (graduated)	28	1.20 (1.08 to 1.33)	1.23 (1.11 to 1.37)	1.19 (1.07 to 1.34)	1.17 (1.05 to 1.31)
College/University (low)	29	1.24 (1.12 to 1.38)	1.22 (1.10 to 1.37)	1.11 (0.98–1.26)	1.09 (0.96–1.24)
College/University (high)	41	1.76 (1.53 to 2.02)	1.64 (1.41 to 1.91)	1.50 (1.27 to 1.77)	1.45 (1.23 to 1.71)
SRTW(≤ 30)‡					
Education					
≤ 10 th grade	27	1	1	1	1
High school (dropout)	32	1.16 (1.02 to 1.31)	1.16 (1.02 to 1.33)	1.12 (0.98–1.28)	1.11 (0.97–1.27)
High school (graduated)	32	1.18 (1.07 to 1.30)	1.20 (1.09 to 1.32)	1.17 (1.06 to 1.29)	1.14 (1.04 to 1.26)
College/University (low)	36	1.30 (1.19 to 1.43)	1.28 (1.16 to 1.41)	1.18 (1.05 to 1.32)	1.15 (1.03 to 1.29)
College/University (high)	47	1.72 (1.53 to 1.94)	1.60 (1.40 to 1.83)	1.47 (1.28 to 1.70)	1.42 (1.23 to 1.64)
SRTW(≤ 90)*§					
Education					
≤ 10 th grade	36	1	1	1	1
High school (dropout)	41	1.16 (1.04 to 1.28)	1.19 (1.07 to 1.32)	1.14 (1.02 to 1.27)	1.13 (1.02 to 1.26)
High school (graduated)	42	1.19 (1.10 to 1.28)	1.19 (1.10 to 1.29)	1.15 (1.06 to 1.25)	1.13 (1.04 to 1.22)
College/university (low)	47	1.31 (1.21 to 1.41)	1.28 (1.18 to 1.38)	1.19 (1.09 to 1.30)	1.17 (1.07 to 1.27)
College/university (high)	57	1.61 (1.46 to 1.78)	1.51 (1.35 to 1.68)	1.39 (1.24 to 1.57)	1.34 (1.19 to 1.50)

*Proportion of participants attaining the respective SRTW outcome for each educational level.
†Full RTW with no registered sickness absence days during 2-year follow-up.
‡Full RTW with up to 30 accumulated registered sickness absence days during 2-year follow-up.
§Full RTW with up to 90 accumulated registered sickness absence days during 2-year follow-up.
RRs, relative risks; RTW, return to work; SRTW, sustainable return to work.

pattern remained, although with slightly attenuated RRs. However, adjusting for occupational category broke the pattern; only the high school graduated and the highest educated still had a significantly higher likelihood of SRTW(0) compared with the lowest-educated (RR=1.12, 95% CI 1.00 to 1.26, and RR=1.24, 95% CI 1.04–1.48, respectively) and for SRTW(≤ 30) (RR=1.22, CI 95% 1.04–1.43). After the final adjustment for the duration of the sick leave spell, only the highest-educated men were more likely to attain SRTW with no sickness absence during follow-up (RR=1.19, CI 95% 1.00–1.41).

Among women, we also found an increased likelihood of SRTW with increased educational level in model one for all three outcomes (table 3). Adjusting for sociodemographic variables marginally attenuated the likelihood of SRTW with increasing educational levels. After adjusting for occupational category, high school graduates and women with higher college/university education still had a higher likelihood of SRTW(0) compared with the lowest educated (RR=1.19, 95% CI 1.07 to 1.34, and RR=1.50, 95% CI 1.27 to

1.77, respectively). For SRTW(≤ 30), the three highest education groups had a higher likelihood of achievement than the lowest educated. All educational groups had a higher likelihood of achieving SRTW(≤ 90) than the lowest educated, ranging from RR=1.13 (95% CI 1.02 to 1.26) among high school dropouts to RR=1.34 (95% 1.19 to 1.50) among the highest educated. This pattern held up for all SRTW outcomes in the fully adjusted model, where the duration of the sick leave spell was included.

Estimates in the sensitivity analyses, where we excluded participants with missing occupational data in regression models 1 and 2, were similar to the presented estimates (models 1 and 2), which indicate that missing data did not introduce bias.

DISCUSSION

Main findings

In this study, we examined the association between education level and SRTW after long-term sick leave

with depression among 4951 men and 8673 women. For all three outcome measures (allowing for up to 0 days, ≤ 30 days and ≤ 90 days of accumulated sick leave during a 2-year follow-up post-RTW), we found an educational gradient with an increased likelihood of SRTW with increasing education levels among men and women. Among men, the educational differences were explained mainly by occupation, whereas among women, the educational differences remained after adjusting for occupation. Adding duration of the sick leave spell in the fully adjusted models had a limited impact.

Strengths and limitations

The main strengths of this study were the large study sample and linking of complete data from high-quality health and administrative registers, which made it possible to construct precise measures of SRTW at the individual level during follow-up. Moreover, the KUHR database records clinical depression diagnosis, which has higher validity in this study because diagnosis and sick leave certifications are commonly issued by GPs. Concerning limitations, we had no information regarding the severity of depression, as ICPC-2 does not allow for such grading. Still, some homogeneity in severity can be inferred, as the study population had reached 3 months of consecutive sick leave with depression at inclusion. We did not have information regarding graded sick leave. Opportunities for graded sick leave differ across workplaces and occupations and can be unevenly distributed across educational levels. Thus, including graded sick leave could have introduced a differential misclassification bias in the relation between exposure and outcome. We had some missing on occupational data (see [table 1](#)). However, sensitivity analyses indicated that missing data on occupation did not introduce bias.

The Norwegian social welfare system is one of the most financially generous in Europe, with its full state funded sick pay coverage for a up to a year, and a relatively short employer covered sick pay period of 16 days. Such conditions may affect SRTW, as they could lower incentives for workers and employers to reduce (and/or avoid) sickness absence.²⁹ Recently, a Norwegian governmental white paper³⁰ proposed more financially restrictive sick pay coverage and a longer employer covered period, aiming to reduce long-term sickness absence, in particular. Similar reforms aimed at reducing sickness absence in other European countries, have shown that a financial ‘tightening of the belt’ and increased oversight does have positive effects. However, such measures also have the unintended consequence of marginalising workers with health issues,²⁹ which likely unproportionally affects SRTW of lower educated people with CMDs in lower socioeconomic positions due to known health disparities. In sum, we consider our findings, though hard to generalise, to be of interest to other countries with universal healthcare and similar social welfare systems.

Results in the context of existing knowledge

Educational gradients in SRTW, similar to the ones found in the present study, have been found in other studies.⁹ However, these studies usually defined SRTW as no sickness absence during the 1–3 month period post-RTW. In the current study, we used a 2-year post-RTW follow-up period. We also allowed for 0 accumulated days, ≤ 30 accumulated days and ≤ 90 accumulated days of all-cause sickness absence during follow-up, reasoning that a working population with depression may require allowance for some absence post-RTW for their RTW to be sustainable due to their elevated risk of recurrent sickness absence.^{1 11} This reasoning aligns with calls for a more inclusive working life for workers with mental health issues.¹⁸ The educational gradient we found was apparent in relative and absolute measures, and allowing for increasing absence during follow-up did not flatten the gradient. Addressing factors that might increase equity in the likelihood of achieving SRTW across education levels should be a priority for policy-makers and stakeholders involved in matters of RTW.

The evidence of higher education as a predictor of SRTW seems consistent.⁹ In the current study, educational differences in the likelihood of SRTW among men were mainly explained by occupational category, pointing to workplaces and occupational life as important arenas for facilitating SRTW after long-term sickness absence with depression among men. This resonates with the findings of a Swedish qualitative study, where men resuming work after sickness absence with CMDs experienced unreasonable work demands, added assignments, norms of ‘hard work’, borderless work, financial responsibility concerns and a feeling of resignation as having to handle these demands challenged the sustainability of their RTW.³¹ Moreover, studies find that men’s work environment, especially among the lower educated, often entails physical, chemical and biological exposures that increase risks of sickness absence, injury and disability.^{15 16 32} Thus, preventive actions to eliminate, or reduce, well-known risk factors in male-dominated workplaces should be promoted to facilitate more equal opportunities for SRTW across educational groups.

The occupational category did not explain the educational differences in SRTW among women. One explanation may be the gender-segregated working life in Norway, where women’s work is relatively homogeneous (ie, human service and caretaking work).³³ Thereby, adjusting for variation in women’s occupation in the association between education and SRTW may have limited explanatory power. Occupation did, however, somewhat attenuate the differences. Generally, the risk for all-cause sickness absence accumulates in occupations where educational demands are low.^{34 35} Regarding the facilitation of SRTW among lower-educated women, consideration should be paid to facilitating decision authority and rewarding work, minding repetitive tasks and emotional and physical demands.^{32 36 37} Among women, the highest educated had a 45% higher likelihood of SRTW with no subsequent sickness absence during follow-up than the

lowest educated. Higher education often facilitates entry into occupations with working conditions more conducive to SRTW and higher pay, likely granting the higher-educated women more of the resources necessary to manage their mental health needs and balance work and family life, in ways that make their RTW more sustainable.³⁸

The factors known to impact RTW creates a complex picture, making it a challenge to assess the importance of a single factor, like education. However, education is strongly associated with various health outcomes. One suggested explanation is that education can provide greater mental health literacy, understood as ‘... the knowledge and abilities necessary to benefit mental health’.^{39,40} Recently, the concept of social insurance literacy has also been introduced, defined as ‘... the extent to which individuals can obtain, understand and act on information in a social insurance system [...]’.⁴¹ The underlying assumption in these lines of literacy research is that education increases the capacity to manage health and sickness absence situations. Additionally, there are more socially relevant aspects of education, like providing an individual with supportive networks in relation to economy, job opportunities, social relations, etc. In this respect, education can be considered an ‘upstream’ factor, affecting other factors further ‘downstream’, such as occupation and socioeconomic mobility, making education a factor of interest for SRTW-research. Still, as our findings point to, we observed differences in SRTW across educational levels among women, even after controlling for several demographic and socioeconomic variables. Why education seems to account for more of the variance in SRTW among women than men is yet to be explored and explained.

Conclusions

Following long-term sick-listed men and women with depression 2 years after resuming work, we found an educational gradient in SRTW which remained consistent when allowing for ≤30 days and ≤90 days of accumulated sickness absence during follow-up. Among men, variation in occupational category largely explained the association between education and SRTW, whereas this was not the case among women. More research is warranted to understand how the complexity of SRTW may differ among men and women.

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Acknowledgements We thank Tatiana Fomina at the Biostatistics and Data analysis core facility (BIOS) at the University of Bergen for help with facilitating data.

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Funding This work was supported by the Research Council of Norway (grant number: 287884).

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval The Regional Committee for Medical and Health Research Ethics, Region West, approved the project (2017/934/REK vest) and waived the requirement of informed consent for the study. Norwegian Data Protection Authority approved using the data for research purposes in this project (17/01372-2/SBO). The register owners, Statistics Norway, the Norwegian Directorate of Health and the Norwegian Institute of Public Health approved the linkage of registries. The data were pseudo-anonymised by a third party (Statistics Norway) and analysed at the group level to minimise the risk of backward identification of individuals. All analyses were carried out, and methods were used in accordance with the relevant guidelines and regulations (the Declaration of Helsinki).

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available. The data used in this study are provided by Statistics Norway, the Norwegian Directorate of Health, and the Norwegian Institute of Public Health, with restrictions only to be used under licence for researchers in the current study, thus, they are not publicly available. However, the registry data used in this study will be available from the authors upon reasonable request and with included permission from the Regional Ethical Committee for Medical and Health Research Ethics, Region West, Norwegian Data Protection Authority, Statistics Norway, the Norwegian Directorate of Health and the Norwegian Institute of Public Health.

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