Positive and negative reasons for sickness presenteeism in Norway and Sweden

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2013-004123
Article Type:	Research
Date Submitted by the Author:	29-Sep-2013
Complete List of Authors:	Johansen, Vegard; Eastern Norway Research Institute, Aronsson, Gunnar; Stockhom University, Psychology Marklund, Staffan; Karolinska Institute, Insurance Medicine
Primary Subject Heading:	Sociology
Secondary Subject Heading:	Public health
Keywords:	PUBLIC HEALTH, STATISTICS & RESEARCH METHODS, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

Title page

Title

Positive and negative reasons for sickness presenteeism in Norway and Sweden

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Key Words

Sickness presenteeism, Survey, Norway, Sweden

Word count main text

3045

Structured abstract

Objectives: This paper investigates various reasons for sickness presenteeism (SP). The research questions asked is: What are the main reported reasons for SP in Norway and Sweden?

Design: Cross-sectional survey in Norway and Sweden, and use of binomial logistic regression analysis.

Participants: The questionnaire was sent to random samples of Norwegian and Swedish workers between 20 and 60 years of age. 2500 responded, and the response rate was 33. Both the Norwegian and Swedish samples are representative with regard to regional background variables and demographic background variables (50% female, 5% western immigrants, 6% non-western immigrants).

Primary and secondary outcome measures: The study gives information about the distribution of SP in Norway and Sweden, and the paper examines the impact of demographic characteristics, socio-economic position and work-related factors on different reasons for SP.

Results: The most frequently reported reasons for SP include; not burden colleagues (43%), enjoy work (37%) and feeling indispensable (35%). A higher proportion of Swedes state that they cannot afford taking sick leave, whilst a higher proportion of Norwegians refer to the benefits of working. Women and young workers more often report that they do not want to burden their colleagues. Persons with lower levels of education, low income and no management responsibilities more often report that they cannot afford to take sick leave. Managers, highly educated persons and the self-employed more often report that they are indispensable.

Conclusions: More than half of the workers in the study experienced SP in the previous year. Positive and negative reasons for SP are reported, and there significant differences between respondents from the two countries examined.

Article summary

Strengths and Limitations of this Study

- Former studies on sickness presenteeism have focused on "negative" reasons, but this study in Norway and Sweden also includes "positive" presence reasons
- The survey includes a number of relevant variables that enable us to control for "competing explanations" in our assessment of cross-country differences on reported reasons for SP.
- The sample is quite large; 2500 workers of which 1400 workers experienced SP
- The response rate is low
- The data may suffer from recall bias and recall bias

Funding Statement

This work was supported by the Norwegian Research Council.

Competing Interests Statement

The authors declare that there is no conflict of interest.

Contributorship Statement

Research Professor Vegard Johansen, Professor Gunnar Aronsson and Professor Staffan Marklund are authors of the manuscript. They designed and monitored the data collection, cleaned and analysed the data, and wrote the paper.

Main text

Introduction

Sickness presenteeism (SP) refers to going to work despite illness.[1 2] This concept has been a subject of steadily increasing interest since it emerged in the 1990s.[3 4 5] Using survey data from a study with more than 2500 workers from 20 to 60 years of age, this paper describes the distribution of eleven reasons for SP in Norway and Sweden. The research question asked is: What are the main reported reasons for SP in Norway and Sweden?

The level of sickness absence SA is presently much higher in Norway compared to Sweden,[6] and there are profound differences between the two countries in attitudes towards SA.[7] Moreover, sickness benefits in Norway are more generous than Sweden: a sick-listed person in Norway receives full compensation of the loss of income from the first day for a maximum of 364 days, while in Sweden the employees themselves pay for the starting day and receive 80% compensation of the loss of income for a maximum of 364 days within a frame of 450 days).[8 9] Contrasting experiences with SP among Norwegian and Swedish respondents, we expect to find differences with regard to the reasons for SP.

Several studies in different countries and among different occupational groups have shown that large shares of employees have gone to work when they ought to stay at home for health reasons. A British study indicated that more than 80% of general practitioners, hospital physicians and senior accountants engaged in SP,[10] and a similar proportion of SP was reported in a Norwegian study of physicians.[11] More than 70% of the Danish core work force reported one or more episodes of SP in a year,[12] and in a study of a Canadian public service organization, more than 70% had SP.[13] In the Netherlands, about 60% of a national sample of workers had attended work even when they felt sick.[14] Finally, 50% of the respondents in a Swedish labour force survey reported SP in 1997,[1] and in a study from 2000, the proportion was 70%.[15]

Previous studies on SP have focused on three issues: the association between SP and SA, the consequences of SP on the productivity of organisations, and the causes of SP.[2 4] First, the association between absenteeism and presenteeism is strongly positive.[1 3 4] Moreover, research results indicate that

SP can cause serious health problems at a later stage[4 16 17 18] and that several episodes of SP during the previous year is a risk factor for future SA.[19]

Second, American research has investigated the consequences of SP on the productivity of organizations. It is claimed that SP causes much more aggregate productivity loss than SA,[20] and that managing SP effectively could be a competitive advantage.[21] It seems that SP can have an impact due to reduced work capacity, but the effects on the quantity and quality of the work performed by personnel with SP should be subject to further investigation.

Third, the causes of SP have been investigated in various Nordic studies. A Swedish study identifies different types of factors related to SP, such as having a health problem, facing personal financial demands, and work-related demands such as staff replacement and time pressure. In addition, the highly educated and the elderly show a lesser tendency toward SP.[15] A Finnish study concludes that SP is sensitive to working-time arrangements, and that those working in the private sector report SP more often than those in the public sector.[3] A Norwegian study argues that there is a correlation between job satisfaction had and rates of SP.[11] In a Danish study it is found that poor health, heavy work, work vs. family conflicts, social support, latitude in decision making and obesity are characteristics among those reporting SP.[4]

Most empirical studies on SP are focused on negative presence factors such as health problems, economic considerations, job insecurity, high workload, inability of others to take over duties, inability to adjust work demands, the need to complete unfinished jobs after returning from sick leave, negative sanctions from colleagues or management , workplace culture, work ethics, feelings of moral obligation, and job satisfaction.[1 2 3 10 11 15 16 22 23] The present study investigates both "positive" presence factors (e.g. "enjoy my work", "going to work was beneficial for my health" etc.) and "negative" presence factors (e.g. "can't afford taking sick leave", "I am worried about being laid off" etc.).[16 23]

Methods

This study uses data from a survey in Norway and Sweden from 2011, funded by the Research Council of Norway. The data collection took two months; it began in the beginning of March and

ended in the beginning of May. The Research Council of Norway had no role in study design; in the collection, analysis and interpretation of the data; in the writing of the article; or in the decision to submit for publication. The research was done in accordance with the rules set by the committees for medical research ethics in Norway and Sweden, was approved by the Norwegian Social Science Data Services, and conforms to the principles embodied in the Declaration of Helsinki.

In both countries, the process of selecting the gross sample was simple random sampling from the population of workers between 20 to 60 years of age. The net samples included 1600 Norwegians and 1250 Swedes. In the analyses the data are weighed according to country of origin, so the Norwegian and Swedish samples have the same influence.

The response rate was low (33% in both countries), but similar to other level of living surveys in Norway and Sweden. Response rates tend to be very low for postal questionnaires,[24] but it was the only financially viable option for our cross-country study. To increase the response rate, the length of the questionnaire was kept quite short (4 pages and 60 questions), a postal follow up including questionnaire was sent, the return envelope was pre-paid, and the information letter stressed the benefits of the study to society.

To test for non-response bias, we compared known values from the population of workers between 20 and 60 years of age and the potential participants, with the values that prevail in the subgroup that answered the questionnaire. It is positive that the Norwegian and Swedish net samples were representative with regard to ethnic background, as well as representative of regional dimensions like the size of municipality, county, and centrality/peripherality. The Norwegian net sample is representative with regard to gender, whilst there is an overrepresentation of women in the Swedish sample. In the net samples for Norway and Sweden, those in the age group 40-60 are overrepresented and those between 20 to 39 years are underrepresented. The data were weighed according to age and gender in order to remedy the underrepresentation of young workers and men.

Questions about SP were answered by 2533 respondents who were either working, in parental leave, or in SA. Frequency of SP (the distribution of SP episodes) was measured by the following question: ‘During the last 12 months, did you go to work despite feeling so ill that you should have taken sick leave?’ A total of 1408 respondents reported SP, and they were asked to select one or more

alternatives from eleven options in response to the question: "Why did you go to work although you were ill?" Some of these reasons were negative (options 1 to 5), some were positive (options 8 to 11), and some can be interpreted as positive and negative (options 6 and 7).

Option 1: Because I am worried about being laid off

Option 2: Because I do not want to be considered lazy or unproductive

Option 3: Because I do not want to be suspected of cheating

Option 4: Because I am ashamed of being ill

Option 5: Because I can't afford taking sick leave

Option 6: Because nobody else is able to carry out my responsibilities

Option 7: Because I do not want to burden my colleagues

Option 8: Because I enjoy my work

Option 9: Because going to work was beneficial for my health

Option 10: Because I want to maintain my social network

Option 11: Because my pride depends on not taking sick leave

Binomial logistic regression has been used to detect which factors influence reasons for SP. Binomial logistic regression is suitable for predicting the outcome of a categorical criterion variable that can take on only two possible outcomes. Nagelkerke R^2 indicates how accurate the models are in terms of how much of the total variation the factors included in the model are able to explain. The independent variables are selected from former studies about factors influencing SP, and they include gender [1, 3, 4], age[4, 15], ethnic background[25], education[1, 3, 15], income[1, 4, 15], , position, type of employment[3, 4, 12, 19], and country.

- Age in years
- Gender: male (reference category, 50% of the sample) and female (50%)

- Ethnic background: divided between natives (reference category, 89% of the sample), western immigrants (comprising Western Europe, Canada, USA, Australia and New Zealand, 5%) and non-western immigrants (comprising persons born in other countries, 6%)
- Education: divided between high educational attainment (Bachelor degree or higher, 36% of the sample) (reference category) and low educational attainment (64%)
- Income: divided between low income (-299,000 NOK/SEK, 40% of the sample), and medium/high income (300,000+ NOK/SEK, 60%)
- Type of employment: divided between employee in private sector (reference category, 51%), employee in public sector (37%) and self-employee (12%)
- Employment position: divided between those that do not have a management position (reference category, 71% of the sample), and middle management/executives (29%)
- Country: Sweden (reference category, 50% of the sample) and Norway (50%)

Results

In the last twelve month period, 56% of the Norwegian and Swedish respondents replied that, , they had gone to work even though it would have been reasonable to take sick leave. 37% reported one or two episodes of SP and 19% reported three or more episodes. In the question about reasons for SP, 32% of the respondents marked one option, 30% marked two options, and 31% marked three or more options, whilst only 7% referred to "other reasons".

(TABLE 1 HERE)

Table 1 shows the distribution of reasons for SP in Norway and Sweden. In total, 43% report going to work while ill because they did not want to burden colleagues with their sick leave, 37% report that they enjoy their work, and 35% report that nobody else can carry out their responsibilities. Some respondents report that they practiced SP because they could not afford taking sick leave (21%), that their pride depended on not taking sick leave (17%), or that they did not want to be considered lazy or

unproductive (16%). Small proportions of respondents reported health benefits (11%), suspected for cheating (8%), shame (6%), maintaining social network (4%), and risk for being laid off (4%).

There are major differences between Norwegian and Swedish respondents with regard to reasons for SP. Swedish respondents are overrepresented among those practicing SP because they cannot afford to be on sick leave (36% in Sweden and only 6% in Norway). Norwegian respondents are overrepresented among those pointing to various "benefits" of going to work despite illness, such as enjoying their work (44% in Norway and 30% in Sweden), their pride depends on not taking sick leave (24% vs 11%), and going to work is beneficial for their health (17% vs 4%). In addition, Norwegian respondents are overrepresented with regard to concern of being considered lazy or unproductive (21% vs 12%).

Table 2 shows four logistic regression models. These models investigate which factors influence the four most often reported reasons for SP.

(TABLE 2 HERE)

Model I concerns factors related to why people report that they take SP because they cannot afford taking sick leave has the best fit of the four models (0.30). Significantly higher rates choosing this alternative include being a Swede, not having managerial responsibilities, having low education, and having low income. It is important to note that the most influential variable in Model I is "country" and not the level of income. Model II is about indispensability, and it shows almost the opposite profile and the estimated fit is the second best (0.14). Norwegians, middle managers and executives, highly educated persons, those with medium/high income, self-employed and private employed, have reported this reason to a significantly higher degree. Models III and IV both show relatively low degree of model fit (0.07 and 0.06 respectively). Model III concerning the option "do not want to burden my colleagues" which was the most frequent reason given in Norway as well as in Sweden has been reported significantly more often among younger workers, among women, among natives and western immigrants, among self-employed and among managers. Model IV concerns the option

"because I enjoy my work", and it was most frequently reported by natives, those with medium/high income, and by Norwegians.

Discussion

This study among Norwegian and Swedish workers suggests that some SP during a working year may be more common than no SP. The most often reported reasons for SP were: do not want to burden my colleagues, enjoy my work, and nobody else is able to carry out my responsibilities. There were significant differences between respondents from the two countries: a higher proportion of Norwegian respondents point to the benefits of going to work despite illness, whilst a higher proportion of Swedish respondents report economic consequences of SP. Although the sample is quite large, the results must be interpreted with caution since the list of options for SP is incomplete and the response rate is low.

A majority of the respondents have experienced SP in the past year, and this finding is in accordance with former studies of SP. [3 10 11 12 13 14 15] Former studies on SP have focused on "negative" reasons, but this study in Norway and Sweden also includes "positive" reasons. It indicates that solidarity with colleagues, high job satisfaction and feeling indispensable are the highest reported reasons for SP. The results resemble studies in Denmark and the UK showing that consideration of colleagues is an often referred reason for SP,[23 26] a study in UK indicating that SP occurs when work cannot wait or be delegated and could create extra work for colleagues,[10] whilst the result on job satisfaction opposes a Norwegian study indicating a positive correlation between low job satisfaction and SP.[11] Some previous studies on SP are mainly focused on negative presence factors, [1 2 3 10 11 15 16 22 23 26] but our empirical results indicate that negative presence factors (lazy, shame, laid off and cheating) are reported by few respondents.

Economic consequences of SA is the fourth reported reason for SP, and the comparison of Norwegian and Swedish respondents illustrate that compensation systems seem to matter. A sick-listed person in Norway receives full compensation from the first day, whilst Swedish employees themselves pay for the starting day and then receive 80% compensation. Swedes report that they

cannot afford to be on sick leave more often than Norwegians, and this finding correspond with former studies that point out that the direct economic consequences of SA can contribute to SP.[1 3 22 23]

The survey includes questions on relevant variables that enable us to control for "competing explanations" in our assessment of cross-country differences on reported reasons for SP. Educational attainment, income level and whether one has managerial responsibilities or not were influential factors for the most common reasons for SP. Managers and highly educated persons are likely to have a high degree of control over their work tasks, to feel time pressure, and to have supervisor responsibilities, and thus, they more often report that they practice SP because nobody else is able to carry out their responsibilities. Less educated persons, those with no management responsibilities, and low income more often report that they cannot afford to take sick leave, illustrating that the financial loss of being absent has a greater impact on these groups. In contrast, persons with high income more often report that they practice SP because they enjoy their work. Women and young workers more often report that they practice SP because they do not want to burden their colleagues. These findings could be an indication of differences in working conditions, for example that a higher share of women than men experience higher levels of cooperation or dependence in performing their work tasks. A competing explanation could be that women and young workers are simply more concerned with relations at work as compared to men and older workers.

More than half of the workers in the study experienced SP in the previous year, but it might be objected that we do not know if there is a large variation between individual's in terms of threshold to report 'should have taken sick leave'. Future studies could investigate what symptoms people that experience SP refer to and whether there are large differences in the seriousness of their illness. Although the study indicates that differences in compensation system between the two countries, educational attainment and position are influential for reasons for SP, further research is needed to understand and explain such differences, as well as the consequences of SP in a shorter and longer term. In retrospect, various strategies could have been considered to increase the response rate and improve the quality of our study: monetary or non-monetary incentives, personalised questionnaires and letters, contacting participants before sending the questionnaires, and more than one follow up.[24]

Other issues are recall bias and response bias, and it could be that data on SP suffer from under-reporting or over-reporting.

The fact that there are differences between Norway and Sweden where larger shares in Sweden and poor people claim that they use SP because they cannot afford to be on sick-leave may indicate that the social security system, particularly in Sweden, is unable to cover all individuals with a health problem in an equal way. The reported positive reasons for well-educated individuals and people in managerial positions to go to work may generally be seen as unproblematic. However, several studies have found that frequent use of SP may lead to future health problems and employers and occupational health services may therefore regard this as an early indicator of reduced productivity and later SA.

The authors declare that there is no conflict of interest.

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Table 1: Reasons for SP in Norway and Sweden, % and p-value (** = significant at 0.01, * = significant at 0.05)

Reasons for SP	Sweden	Norway	Total	p
Because I do not want to burden my colleagues	41	46	43	
Because I enjoy my work	30	44	37	**
Because nobody else is able to carry out my responsibilities	36	34	35	
Because I can't afford taking sick leave	36	6	21	**
Because my pride depends on not taking sick leave	11	24	17	**
Because I do not want to be considered lazy or unproductive	12	21	16	**
Because going to work was beneficial for my health	4	17	11	**
Because I do not want to be suspected of cheating	8	8	8	
Because I am ashamed of being ill	4	7	6	*
Because I want to maintain my social network	2	6	4	**
Because I am worried about being laid off	4	3	4	

N = 1408

Table 2: Individual, sociodemographic and workplace factors of relevance to reasons for SP, OR (95% Cl) and p value (** = significant at 0.01, * = significant at 0.05)

	Model I Economic considerations	Model II Indispensable	Model III Not burden colleagues	Model IV Enjoy my work
Age	0.99 (0.98 to 1.00)	0.99 (0.98 to 1.00)	0.99** (0.98 to 1.00)	1.00 (0.99 to 1.01)
Male	1.00	1.00	1.00	1.00
Female	0.79 (0.55 to 1.12)	0.88 (0.67 to 1.16)	1.75** (1.35 to 2.26)	0.95 (0.73 to 1.24)
Native	1.00	1.00	1.00	1.00
Western	1.67 (0.91 to 3.01)	0.89 (0.51 to 1.54)	1.02 (0.62 to 1.69)	0.54* (0.31 to 0.95)
Non-western	1.59 (0.89 to 2.86)	1.25 (0.73 to 2.11)	0.49** (0.29 to 0.84)	0.79 (0.47 to 1.34)
High education	1.00	1.00	1.00	1.00
Low education	1.68** (1.16 to 2.44)	0.39** (0.30 to 0.52)	1.22 (0.93 to 1.58)	0.8 (0.65 to 1.11)
Medium/high income	1.00	1.00	1.00	1.00
Low income	2.57** (1.81 to 3.65)	0.74* (0.55 to 0.99)	0.98 (0.74 to 1.29)	0.67** (0.50 to 0.89)
Private employment	1.00	1.00	1.00	1.00
Self-employment	1.10 (0.65 to 1.84)	1.80** (1.20 to 2.69)	0.61* (0.40 to 0.93)	0.89 (0.59 to 1.34)
Public employment	1.27 (0.88 to 1.85)	0.57** (0.42 to 0.77)	1.25 (.96 to 1.64)	0.91 (0.69 to 1.20)
Non-management	1.00	1.00	1.00	1.00
Middle m./executives	0.54** (0.36 to 0.81)	2.19** (1.67 to 2.86)	0.73* (0.56 to 0.96)	1.13 (0.87 to 1.47)
Sweden	1.00	1.00	1.00	1.00
Norway	0.16** (0.10 to 0.22)	0.76* (0.59 to 0.98)	1.18 (0.92 to 1.51)	1.64** (1.28 to 2.09)
Constant	-0.98	0.89	0.96	0.54
Nagelkerke R^2	0.30	0.14	0.07	0.06

STROBE 2007 (v4) checklist of items to be included in reports of observational studies in epidemiology*

Checklist for cohort, case-control, and cross-sectional studies (combined)

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any pre-specified hypotheses	2, 7
Methods			
Study design	4	Present key elements of study design early in the paper	2, 4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	8-9
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-9
Bias	9	Describe any efforts to address potential sources of bias	6, 12
Study size	10	Explain how the study size was arrived at	5-7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-9
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7, 9
		(*b*) Describe any methods used to examine subgroups and interactions	7-8
		(*c*) Explain how missing data were addressed	
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed	6-7

		Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6-7
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6-7
		(b) Indicate number of participants with missing data for each variable of interest	6-7
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	8-9
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	9, 16-17
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	2, 3, 10-12
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	2, 6-7, 11-12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	2, 3, 11-12
Generalisability	21	Discuss the generalisability (external validity) of the study results	6-7
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	5-6

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.
Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Positive and negative reasons for sickness presenteeism in Norway and Sweden

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2013-004123.R1
Article Type:	Research
Date Submitted by the Author:	20-Nov-2013
Complete List of Authors:	Johansen, Vegard; Eastern Norway Research Institute, Aronsson, Gunnar; Stockhom University, Psychology Marklund, Staffan; Karolinska Institute, Insurance Medicine
Primary Subject Heading:	Sociology
Secondary Subject Heading:	Public health
Keywords:	PUBLIC HEALTH, STATISTICS & RESEARCH METHODS, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

Title page

Title

Positive and negative reasons for sickness presenteeism in Norway and Sweden

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Key Words

Sickness presenteeism, Survey, Norway, Sweden

Word count main text

3483

Structured abstract

Objectives: This paper investigates various reasons for sickness presenteeism (SP) , i.e. going to work despite illness. The research questions asked is: What are the main reported reasons for SP in Norway and Sweden?

Design: Cross-sectional survey in Norway and Sweden. Use of binomial logistic regression analysis and reporting odds ratio (OR) and 95% Confidence Interval (CI).

Participants: The selection of the gross samples were done by companies having complete and updated databases of the Norwegian population and Swedish population. They used simple random sampling from the population between 20 to 60 years of age. The response rates were 33% in both countries. 2500 workers responded to questions about SP during the last 12 months.

Primary and secondary outcome measures: The paper informs about the distribution of reasons for SP in Norway and Sweden, and the respondents selected these reasons from a closed list. The paper also examines which factors influence the most often reported reasons for SP.

Results: 56% of the Norwegian and Swedish respondents experienced SP in the previous year. The most frequently reported reasons for SP include; not burden colleagues (43%), enjoy work (37%) and feeling indispensable (35%). A lower proportion of Norwegians state that they cannot afford taking sick leave (OR = 0.16 (CI = 0.10-0.22)), whilst a higher proportion of Norwegians refer to that they enjoy their work (OR = 1.64 (CI = 1.28-2.09)). Women and young workers more often report that they do not want to burden their colleagues. Managers (OR = 2.19 (CI = 1.67-2.86)), highly educated persons and the self-employed more often report that they are indispensable.

Conclusions: Positive and negative reasons for SP are reported, and there significant differences between respondents from the two countries examined. The response rate is low and results must be interpreted with caution.

Study design

Cross-sectional study

Article summary

Article Focus

- This paper investigates various reasons for sickness presenteeism (SP)

- The research question is: What are the main reported reasons for SP in Norway and Sweden?

Key Messages

- The most often reported reasons for SP among Norwegian and Swedish workers include the desire to not put a burden on colleagues, enjoy work and feeling indispensable

- Cross-country differences in reported reasons for SP are revealed

- Education level, income level and employment position also influence reasons for SP

Strengths and Limitations

- The sample is quite large; 2500 workers of which 1400 workers experienced SP

- The respondents could choose from twelve positive and negative reasons for SP

- The response rate is low, and the responses to SP may suffer from recall bias

Main text

Introduction

Sickness presenteeism (SP) refers to going to work despite illness.[1 2] This concept has been a subject of steadily increasing interest since it emerged in the 1990s.[3 4 5] Several studies in different countries and among different occupational groups have shown that large shares of employees have gone to work when they ought to stay at home for health reasons. A British study indicated that more than 80% of general practitioners, hospital physicians and senior accountants engaged in SP,[6] and a similar proportion of SP was reported in a Norwegian study of physicians.[7] More than 70% of the Danish core work force reported one or more episodes of SP in a year,[8] and in a study of a Canadian public service organization, more than 70% had SP.[9] In the Netherlands, about 60% of a national sample of workers had attended work even when they felt sick.[10] Finally, 50% of the respondents in a Swedish labour force survey reported SP in 1997,[1] and in a study from 2000, the proportion was 70%.[11]

Previous studies on SP have focused on three issues: the association between SP and sickness absence (SA), the consequences of SP on the productivity of organisations, and the causes of SP.[2 4] First, the association between absenteeism and presenteeism is strongly positive.[1 3 4] Moreover, research results indicate that SP can cause serious health problems at a later stage[4 12 13 14] and that several episodes of SP during the previous year is a risk factor for future SA.[15]

Second, American researchers have investigated the consequences of SP on the productivity of organizations. It is claimed that SP causes much more aggregate productivity loss than SA,[16] and that managing SP effectively could be a competitive advantage.[17] It seems that SP can have an impact due to reduced work capacity, but the effects on the quantity and quality of the work performed by personnel with SP should be subject to further investigation.

Third, the causes of SP have been investigated in various Nordic studies. A Swedish study identifies different types of factors related to SP, such as reporting variable/rather poor/poor health status, facing personal financial demands, and work-related demands such as staff replacement and time pressure.[11] A Finnish study concludes that SP is sensitive to working-time arrangements, and that those working in the private sector report SP more often than those in the public sector.[3] A Norwegian study argues that there is a positive correlation between job satisfaction and rates of SP.[7] In a Danish

study it is found that poor health, heavy work, work vs. family conflicts, social support, latitude in decision making and obesity are characteristics among those reporting SP.[4]

Most empirical studies on SP are focused on negative presence factors such as health problems, economic considerations, job insecurity, high workload, inability of others to take over duties, inability to adjust work demands, the need to complete unfinished jobs after returning from sick leave, negative sanctions from colleagues or management , workplace culture, work ethics, feelings of moral obligation, and job satisfaction.[1 2 3 6 7 11 12 18 19] The present study investigates both "positive" presence factors (e.g. "enjoy my work", "going to work was beneficial for my health" etc.) and "negative" presence factors (e.g. "can't afford taking sick leave", "I am worried about being laid off" etc.).[12 19] Using data from a cross-country study, this paper describes the distribution of twelve reasons for SP in Norway and Sweden. The research question asked is: *What are the main reported reasons for SP in Norway and Sweden?*

Methods

This study uses data from a survey in Norway and Sweden from 2011. The purpose was to study "a normal population`s" attitudes to and experiences with SA and SP. We carried out a postal survey since this was the only financially viable option for our cross-country study. The Norwegian survey was administered by Eastern Norway Research Institute and the Swedish survey was administered by ScandInfo. The data collection was part of a research project called "Social factors contributing to sickness absence" (SOFAC). Researchers from Eastern Norway Research Institute, Lillehammer University College and Stockholm University collaborate in SOFAC, and the project is funded by the Research Council of Norway. The Research Council of Norway had no role in study design; in the collection, analysis and interpretation of the data; in the writing of the article; or in the decision to submit for publication. The data collection took two months; it began in the beginning of March and ended in the beginning of May.

In both countries the process of selecting the gross sample was simple random sampling from the population between 20 to 60 years of age. The potential participants included people working full-time and part-time, on parental leave and on sick leave, as well as unemployed people, students and

receivers of disability pension. The selection of the gross sample in Norway was done by Bisnode Match It, and they have a complete and updated database of the Norwegian population. The selection of the gross sample in Sweden was done by ScandInfo, and they have a complete and updated database of the Swedish population. 4900 Norwegians were asked to participate in the survey and 1594 responded. 3800 Swedes were asked to participate and 1249 responded.

The information letter stated that the aim of the survey was to map experiences and attitudes to sick leave among representative samples in Norway and Sweden. It stated that the study was approved by the Data Protection Official for Research (Norwegian Social Science Data Services), and that all respondents were anonymous to the research team. Direct personal data was not collected, and none of the respondents could be identified through a combination of background information since we asked few background variables. Finally, the information letter included information about e-mail and telephone to the researchers in the project.

The questionnaire was designed particularly for the SOFAC-project. In the pilot study in Norway, respondents used about 15 minutes to fill out the questionnaire. The questionnaire included questions on a few background variables, about the employment situation, experiences with sick leave, experiences with SP, attitudes to sick leave in general, and attitudes to sick leave due to psychological illness and skeletal-muscular disease. The full questionnaire is available upon request to the research team.

Statistics Norway and Statistics Sweden are sources of factual information about the populations in Norway and Sweden, and distributions of sex, age, immigration, education level, county, centrality/peripherality, municipality size are presented annually and can be accessed online.[20] [21] To test for non-response bias, we compared known values from the population between 20 and 60 years of age (potential participants) with the values that prevail in the subgroup that answered the questionnaire. It is positive that the Norwegian and Swedish net samples were representative with regard to the proportion of immigrants, as well as representative of regional dimensions like the size of municipality, county, and centrality/peripherality. The Norwegian net sample is representative with regard to gender, whilst there is an overrepresentation of women in the Swedish sample. In the net samples for Norway and Sweden, those in the age group 40-60 are overrepresented and those between

20 to 39 years are underrepresented. The data were weighed according to age and gender in order to remedy the underrepresentation of young workers and men. The data are weighed according to country of origin, so the Norwegian and Swedish samples have the same influence.

Questions about SP were answered by 2533 respondents who were either working, in parental leave, or in SA. Frequency of SP (the distribution of SP episodes) was measured by the following question: 'During the last 12 months, did you go to work despite feeling so ill that you should have taken sick leave?' A total of 1408 respondents reported SP, and they selected one or more alternatives from twelve options in response to the question: "Why did you go to work although you were ill?" The response options were chosen by the research team and based on former studies about SP and SA. Some of these reasons were negative (options 1 to 5), some were positive (options 8 to 11), and some can be interpreted as positive and negative (options 6 and 7).

Option 1: Because I am worried about being laid off

Option 2: Because I do not want to be considered lazy or unproductive

Option 3: Because I do not want to be suspected of cheating

Option 4: Because I am ashamed of being ill

Option 5: Because I can't afford taking sick leave

Option 6: Because nobody else is able to carry out my responsibilities

Option 7: Because I do not want to burden my colleagues

Option 8: Because I enjoy my work

Option 9: Because going to work was beneficial for my health

Option 10: Because I want to maintain my social network

Option 11: Because my pride depends on not taking sick leave

Option 12: There were other reasons that I went to work

Binomial logistic regression has been used to detect which factors influence reasons for SP. Binomial logistic regression is suitable for predicting the outcome of a categorical criterion variable that can take on only two possible outcomes. Nagelkerke R^2 is an often used version of the coefficient for

determination for logistic regression. Nagelkerke R^2 ranges from 0 to 1, and it provides a gauge of the substantive significance of the model.[22]

The independent variables are selected from former studies about factors influencing SP, and they include gender [1, 3, 4], age[4, 11], migratory status[23], education[1, 3, 11], income[1, 4, 11], , position, type of employment[3, 4, 8, 15], and country. Some respondents did not answer all the independent variables, and 1270 respondents are included in the binomial logistic regression analyses.

- Age in years.
- Gender: male (reference category) and female.
- Migratory status: divided between natives (reference category), western immigrants (comprising Western Europe, Canada, USA, Australia and New Zealand) and non-western immigrants (comprising persons born in other countries).
- Education: divided between high educational attainment (reference category, Bachelor degree or higher) and low educational attainment.
- Income: divided between low income (reference category, -299,000 NOK/SEK), and medium/high income (300,000+ NOK/SEK). 300000 NOK is about 36000 Euros and 300000 SEK is about 33000 Euros.
- Type of employment: divided between employee in private sector (reference category), employee in public sector and self-employee.
- Employment position: divided between those that do not have a management position (reference category), and middle management/executives.
- Country: Sweden (reference category) and Norway-

The research was done in accordance with the rules set by the committees for medical research ethics in Norway and Sweden, was approved by the Norwegian Social Science Data Services, and conforms to the principles embodied in the Declaration of Helsinki.

Results

The response rate was 33% in both countries. In the last twelve month period, 56% of the Norwegian and Swedish respondents replied that they had gone to work even though it would have been reasonable to take sick leave. 37% reported one/two episodes of SP and 19% reported three or more episodes. In the question about reasons for SP, 32% of the respondents marked one option, 30% marked two options, and 31% marked three or more options, and 7% referred to "other reasons".

(TABLE 1 HERE)

Table 1 shows the distribution of reasons for SP in Norway and Sweden. In total, 43% report going to work while ill because they did not want to burden colleagues with their sick leave, 37% report that they enjoy their work, and 35% report that nobody else can carry out their responsibilities. Some respondents report that they practiced SP because they could not afford taking sick leave (21%), that their pride depended on not taking sick leave (17%), or that they did not want to be considered lazy or unproductive (16%). Small proportions of respondents reported health benefits (11%), suspected for cheating (8%), shame (6%), maintaining social network (4%), and risk for being laid off (4%).

There are major differences between Norwegian and Swedish respondents with regard to reasons for SP. Swedish respondents are overrepresented among those practicing SP because they cannot afford to be on sick leave (36% in Sweden and only 6% in Norway). Norwegian respondents are overrepresented among those pointing to various "benefits" of going to work despite illness, such as enjoying their work (44% in Norway and 30% in Sweden), their pride depends on not taking sick leave (24% vs 11%), and going to work is beneficial for their health (17% vs 4%). In addition, Norwegian respondents are overrepresented with regard to concern of being considered lazy or unproductive (21% vs 12%).

We have chosen to investigate which factors influence the four most often reported reasons for SP, as seen in table 1.

(TABLE 2 HERE)

Table 2 shows four logistic regression models. Model I concerns factors related to why people report that they take SP because they cannot afford taking sick leave has the best fit of the four models (Nagelke $R^2 = 0.30$). Significantly higher rates choosing this alternative include being a Swede, not having managerial responsibilities, having low education, and having low income. It is important to note that the most influential variable in Model I is "country" and not the level of income. Model II is about indispensability, and it shows almost the opposite profile and the estimated fit is the second best (Nagelke R2 = 0.14). Norwegians, middle managers and executives, highly educated persons, those with medium/high income, self-employed and private employed, have reported this reason to a significantly higher degree. Models III and IV both show relatively low degree of model fit (Nagelkerke $R^2 = 0.07$ and 0.06 respectively). Model III concerning the option "do not want to burden my colleagues" which was the most frequent reason given in Norway as well as in Sweden has been reported significantly more often among younger workers, among women, among natives and western immigrants, among self-employed and among managers. Model IV concerns the option "because I enjoy my work", and it was most frequently reported by natives, those with medium/high income, and by Norwegians.

Discussion

The most often reported reasons for SP were: do not want to burden my colleagues, enjoy my work, and nobody else is able to carry out my responsibilities. There were significant differences between respondents from the two countries: a higher proportion of Norwegian respondents point to the benefits of going to work despite illness, whilst a higher proportion of Swedish respondents report economic consequences of SP. Although the sample is quite large, the results must be interpreted with caution since the list of options for SP is incomplete. Another concern is the low response rate, which is similar to other level of living surveys in Norway and Sweden.

A majority of the respondents in Norway and Sweden have experienced SP in the past year, and this finding is in accordance with former studies of SP. [3 6 7 8 9 10 11] This study indicates that solidarity with colleagues, feeling indispensable, and to enjoy the work are the highest reported

reasons for SP. The results resemble studies in Denmark and the UK showing that consideration of colleagues is an often referred reason for SP,[19 24] and a study in UK indicating that SP occurs when work cannot wait or be delegated and could create extra work for colleagues.[6] Some previous studies on SP have focused on negative presence factors, [1 2 3 6 7 11 12 18 19 24] but our empirical results indicate that negative presence factors (lazy, shame, laid off and cheating) are reported by few respondents.

We expected to find differences with regard to the reasons for SP in Norway and Sweden since the level of SA is presently much higher in Norway compared to Sweden[25] and there are profound differences between the two countries in attitudes towards SA.[26] Moreover, sickness benefits in Norway are more generous than Sweden: a sick-listed person in Norway receives full compensation of the loss of income from the first day for a maximum of 364 days, whereas in Sweden the first day of SA is not compensated and from the second day the employees receive 80% compensation of the loss of income for a maximum of 364 days within a frame of 450 days.[27 28] Economic consequences of SA is the fourth reported reason for SP, and Swedes report that they cannot afford to be on sick leave more often than Norwegians. This finding correspond with former studies that point out that the direct economic consequences of SA can contribute to SP.[1 3 18 19]

The survey includes questions on relevant variables that enable us to control for "competing explanations" in our assessment of cross-country differences on reported reasons for SP. Educational attainment, income level and whether one has managerial responsibilities or not were influential factors for the most common reasons for SP. Managers and highly educated persons are likely to have a high degree of control over their work tasks, to feel time pressure, and to have supervisor responsibilities, and thus, they more often report that they practice SP because nobody else is able to carry out their responsibilities. Less educated persons, those with no management responsibilities, and low income more often report that they cannot afford to take sick leave, illustrating that the financial loss of being absent has a greater impact on these groups. In contrast, persons with high income more often report that they practice SP because they enjoy their work. Women and young workers more often report that they practice SP because they do not want to burden their colleagues. These findings could be an indication of differences in working conditions, for example that a higher share of women than men experience higher levels of cooperation or dependence in performing their work tasks. A

competing explanation could be that women and young workers are simply more concerned with relations at work as compared to men and older workers.

More than half of the workers in the study experienced SP in the previous year, but it might be objected that we do not know if there is a large variation between individual's in terms of threshold to report 'should have taken sick leave'. Future studies could investigate what symptoms people that experience SP refer to and whether there are large differences in the seriousness of their illness. Although the study indicates that differences in compensation system between the two countries, educational attainment and position are influential for reasons for SP, further research is needed to understand and explain such differences, as well as the consequences of SP in a shorter and longer term.

Response rates tend to be very low for postal questionnaires.[29] To increase the response rate, the length of the questionnaire was kept quite short (4 pages and 60 questions), a postal follow up including questionnaire was sent, the return envelope was pre-paid, and the information letter stressed the benefits of the study to society. The quality of postal addresses provided by Bisnode Match It and Scandinfo were good, since less than 300 letters were returned (3% of the gross sample). In retrospect, various strategies could have been considered to increase the response rate and improve the quality of our study: monetary or non-monetary incentives, personalised questionnaires and letters, contacting participants before sending the questionnaires, and more than one follow up.[29]

It is difficult to make conclusions about the accuracy of our survey, and the responses to questions on SP might have been influenced by recall bias. Another issue of concern is response bias, and some studies have shown that employees tend to under-report their SA.[30] It could also be that workers having experienced SP are represented in a higher proportion in the sample, and this could result in an overestimation of SP as compared to the situation in the population. It should be noted that the distribution of SP is in accordance with prior studies of SP at the national level.[1 8 10] It could be that data on SP suffer from under-reporting or over-reporting, but this study did not control for this possibility.

The fact that there are differences between Norway and Sweden where larger shares in Sweden and poor people claim that they use SP because they cannot afford to be on sick-leave may indicate that the Swedish social security system is unable to cover all individuals with a health problem in an equal way. Still, it is important to be clear that other reasons than the social security system could matter for these differences. When respondents report that they practice SP because they enjoy their work, this may generally be seen as unproblematic. However, several studies have found that frequent use of SP may lead to future health problems[4 12 13 14] and employers and occupational health services may therefore regard this as an early indicator of reduced productivity and later SA.

The authors declare that there is no conflict of interest.

Contributorship Statement

Research Professor Vegard Johansen, Professor Gunnar Aronsson and Professor Staffan Marklund are authors of the manuscript. They designed and monitored the data collection, cleaned and analysed the data, and wrote the paper.

Funding Statement

This work was supported by the Norwegian Research Council.

Competing Interests Statement

The authors declare that there is no conflict of interest.

Data Sharing Statement

There are no additional data available.

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Table 1: Reported reasons for SP in Norway and Sweden, % and p value (Chi square tests)

Reasons for SP	Sweden	Norway	Total	p value
Because I do not want to burden my colleagues	41	46	43	0.059
Because I enjoy my work	30	44	37	0.000
Because nobody else is able to carry out my responsibilities	36	34	35	0.404
Because I can't afford taking sick leave	36	6	21	0.000
Because my pride depends on not taking sick leave	11	24	17	0.000
Because I do not want to be considered lazy or unproductive	12	21	16	0.000
Because going to work was beneficial for my health	4	17	11	0.000
Because I do not want to be suspected of cheating	8	8	8	0.689
Because I am ashamed of being ill	4	7	6	0.013
Because I want to maintain my social network	2	6	4	0.000
Because I am worried about being laid off	4	3	4	0.179

N = 1408 (Norway and Sweden)

Table 2: Factors of relevance to four most often reported reasons for SP among workers in Norway and Sweden, 2011, adjusted OR (95% Confidence Interval) and p value (** = significant at 0.01, * = significant at 0.05)

Factors	Model I Because I can't afford taking sick leave	Model II Because nobody else is able to carry out my responsibilities	Model III Because I do not want to burden my colleagues	Model IV Because I enjoy my work
Age (n = 1270)	0.99 (0.98 to 1.00)	0.99 (0.98 to 1.00)	0.99** (0.98 to 1.00)	1.00 (0.99 to 1.01)
Male (n = 660, 52%)	1.00	1.00	1.00	1.00
Female (n = 610, 48%)	0.79 (0.55 to 1.12)	0.88 (0.67 to 1.16)	1.75** (1.35 to 2.26)	0.95 (0.73 to 1.24)
Native (n = 1128, 89%)	1.00	1.00	1.00	1.00
Western (n = 70, 5%)	1.67 (0.91 to 3.01)	0.89 (0.51 to 1.54)	1.02 (0.62 to 1.69)	0.54* (0.31 to 0.95)
Non-western (n = 72, 6%)	1.59 (0.89 to 2.86)	1.25 (0.73 to 2.11)	0.49** (0.29 to 0.84)	0.79 (0.47 to 1.34)
High education (n = 437, 34%)	1.00	1.00	1.00	1.00
Low education (n = 833, 66%)	1.68** (1.16 to 2.44)	0.39** (0.30 to 0.52)	1.22 (0.93 to 1.58)	0.8 (0.65 to 1.11)
Medium/high income (n = 819, 64%)	1.00	1.00	1.00	1.00
Low income (n = 451, 36%)	2.57** (1.81 to 3.65)	0.74* (0.55 to 0.99)	0.98 (0.74 to 1.29)	0.67** (0.50 to 0.89)
Private employment (n = 686, 54%)	1.00	1.00	1.00	1.00
Self-employment (n = 134, 11%)	1.10 (0.65 to 1.84)	1.80** (1.20 to 2.69)	0.61* (0.40 to 0.93)	0.89 (0.59 to 1.34)
Public employment (n = 450, 35%)	1.27 (0.88 to 1.85)	0.57** (0.42 to 0.77)	1.25 (.96 to 1.64)	0.91 (0.69 to 1.20)
Non-management (n = 874, 69%)	1.00	1.00	1.00	1.00
Middle m./executives (N = 396, 31%)	0.54** (0.36 to 0.81)	2.19** (1.67 to 2.86)	0.73* (0.56 to 0.96)	1.13 (0.87 to 1.47)
Sweden (n = 618, 49%)	1.00	1.00	1.00	1.00
Norway (n = 651, 51%)	0.16** (0.10 to 0.22)	0.76* (0.59 to 0.98)	1.18 (0.92 to 1.51)	1.64** (1.28 to 2.09)
Constant	-0.98	0.89	0.96	0.54
Nagelkerke R^2	0.30	0.14	0.07	0.06

N = 1270

Title page

Title

Positive and negative reasons for sickness presenteeism in Norway and Sweden

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Key Words

Sickness presenteeism, Survey, Norway, Sweden

Word count main text

3483

Structured abstract

Objectives: This paper investigates various reasons for sickness presenteeism (SP) , i.e. going to work despite illness. The research questions asked is: What are the main reported reasons for SP in Norway and Sweden?

Design: Cross-sectional survey in Norway and Sweden. Use of binomial logistic regression analysis and reporting odds ratio (OR) and 95% Confidence Interval (CI).

Participants: The selection of the gross samples were done by companies having complete and updated databases of the Norwegian population and Swedish population. They used simple random sampling from the population between 20 to 60 years of age. The response rates were 33% in both countries. 2500 workers responded to questions about SP during the last 12 months.

Primary and secondary outcome measures: The paper informs about the distribution of reasons for SP in Norway and Sweden, and the respondents selected these reasons from a closed list. The paper also examines which factors influence the most often reported reasons for SP.

Results: 56% of the Norwegian and Swedish respondents experienced SP in the previous year. The most frequently reported reasons for SP include; not burden colleagues (43%), enjoy work (37%) and feeling indispensable (35%). A lower proportion of Norwegians state that they cannot afford taking sick leave (OR = 0.16 (CI = 0.10-0.22)), whilst a higher proportion of Norwegians refer to that they enjoy their work (OR = 1.64 (CI = 1.28-2.09)). Women and young workers more often report that they do not want to burden their colleagues. Managers (OR = 2.19 (CI = 1.67-2.86)), highly educated persons and the self-employed more often report that they are indispensable.

Conclusions: Positive and negative reasons for SP are reported, and there significant differences between respondents from the two countries examined. The response rate is low and results must be interpreted with caution.

Study design

Cross-sectional study

Article summary

Article Focus

- This paper investigates various reasons for sickness presenteeism (SP)

- The research question is: What are the main reported reasons for SP in Norway and Sweden?

Key Messages

- The most often reported reasons for SP among Norwegian and Swedish workers include the desire to not put a burden on colleagues, enjoy work and feeling indispensable

- Cross-country differences in reported reasons for SP are revealed

- Education level, income level and employment position also influence reasons for SP

Strengths and Limitations

- The sample is quite large; 2500 workers of which 1400 workers experienced SP

- The respondents could choose from twelve positive and negative reasons for SP

- The response rate is low, and the responses to SP may suffer from recall bias

Contributorship Statement

Research Professor Vegard Johansen, Professor Gunnar Aronsson and Professor Staffan Marklund are authors of the manuscript. They designed and monitored the data collection, cleaned and analysed the data, and wrote the paper.

Funding Statement

This work was supported by the Norwegian Research Council.

Competing Interests Statement

The authors declare that there is no conflict of interest.

Main text

Introduction

Sickness presenteeism (SP) refers to going to work despite illness.[1 2] This concept has been a subject of steadily increasing interest since it emerged in the 1990s.[3 4 5] Several studies in different countries and among different occupational groups have shown that large shares of employees have gone to work when they ought to stay at home for health reasons. A British study indicated that more than 80% of general practitioners, hospital physicians and senior accountants engaged in SP,[6] and a similar proportion of SP was reported in a Norwegian study of physicians.[7] More than 70% of the Danish core work force reported one or more episodes of SP in a year,[8] and in a study of a Canadian public service organization, more than 70% had SP.[9] In the Netherlands, about 60% of a national sample of workers had attended work even when they felt sick.[10] Finally, 50% of the respondents in a Swedish labour force survey reported SP in 1997,[1] and in a study from 2000, the proportion was 70%.[11]

Previous studies on SP have focused on three issues: the association between SP and sickness absence (SA), the consequences of SP on the productivity of organisations, and the causes of SP.[2 4] First, the association between absenteeism and presenteeism is strongly positive.[1 3 4] Moreover, research results indicate that SP can cause serious health problems at a later stage[4 12 13 14] and that several episodes of SP during the previous year is a risk factor for future SA.[15]

Second, American researchers have investigated the consequences of SP on the productivity of organizations. It is claimed that SP causes much more aggregate productivity loss than SA,[16] and that managing SP effectively could be a competitive advantage.[17] It seems that SP can have an impact due to reduced work capacity, but the effects on the quantity and quality of the work performed by personnel with SP should be subject to further investigation.

Third, the causes of SP have been investigated in various Nordic studies. A Swedish study identifies different types of factors related to SP, such as reporting variable/rather poor/poor health status, facing personal financial demands, and work-related demands such as staff replacement and time pressure.[11] A Finnish study concludes that SP is sensitive to working-time arrangements, and that those working in the private sector report SP more often than those in the public sector.[3] A Norwegian study argues that there is a positive correlation between job satisfaction and rates of SP.[7] In a Danish

study it is found that poor health, heavy work, work vs. family conflicts, social support, latitude in decision making and obesity are characteristics among those reporting SP.[4]

Most empirical studies on SP are focused on negative presence factors such as health problems, economic considerations, job insecurity, high workload, inability of others to take over duties, inability to adjust work demands, the need to complete unfinished jobs after returning from sick leave, negative sanctions from colleagues or management , workplace culture, work ethics, feelings of moral obligation, and job satisfaction.[1 2 3 6 7 11 12 18 19] The present study investigates both "positive" presence factors (e.g. "enjoy my work", "going to work was beneficial for my health" etc.) and "negative" presence factors (e.g. "can't afford taking sick leave", "I am worried about being laid off" etc.).[12 19] Using data from a cross-country study, this paper describes the distribution of twelve reasons for SP in Norway and Sweden. The research question asked is: *What are the main reported reasons for SP in Norway and Sweden?*

Methods

This study uses data from a survey in Norway and Sweden from 2011. The purpose was to study "a normal population`s" attitudes to and experiences with SA and SP. We carried out a postal survey since this was the only financially viable option for our cross-country study. The Norwegian survey was administered by Eastern Norway Research Institute and the Swedish survey was administered by ScandInfo. The data collection was part of a research project called "Social factors contributing to sickness absence" (SOFAC). Researchers from Eastern Norway Research Institute, Lillehammer University College and Stockholm University collaborate in SOFAC, and the project is funded by the Research Council of Norway. The Research Council of Norway had no role in study design; in the collection, analysis and interpretation of the data; in the writing of the article; or in the decision to submit for publication. The data collection took two months; it began in the beginning of March and ended in the beginning of May.

In both countries the process of selecting the gross sample was simple random sampling from the population between 20 to 60 years of age. The potential participants included people working full-time and part-time, on parental leave and on sick leave, as well as unemployed people, students and

receivers of disability pension. The selection of the gross sample in Norway was done by Bisnode Match It, and they have a complete and updated database of the Norwegian population. The selection of the gross sample in Sweden was done by ScandInfo, and they have a complete and updated database of the Swedish population. 4900 Norwegians were asked to participate in the survey and 1594 responded. 3800 Swedes were asked to participate and 1249 responded.

The information letter stated that the aim of the survey was to map experiences and attitudes to sick leave among representative samples in Norway and Sweden. It stated that the study was approved by the Data Protection Official for Research (Norwegian Social Science Data Services), and that all respondents were anonymous to the research team. Direct personal data was not collected, and none of the respondents could be identified through a combination of background information since we asked few background variables. Finally, the information letter included information about e-mail and telephone to the researchers in the project.

The questionnaire was designed particularly for the SOFAC-project. In the pilot study in Norway, respondents used about 15 minutes to fill out the questionnaire. The questionnaire included questions on a few background variables, about the employment situation, experiences with sick leave, experiences with SP, attitudes to sick leave in general, and attitudes to sick leave due to psychological illness and skeletal-muscular disease. The full questionnaire is available upon request to the research team.

Statistics Norway and Statistics Sweden are sources of factual information about the populations in Norway and Sweden, and distributions of sex, age, immigration, education level, county, centrality/peripherality, municipality size are presented annually and can be accessed online.[20] [21] To test for non-response bias, we compared known values from the population between 20 and 60 years of age (potential participants) with the values that prevail in the subgroup that answered the questionnaire. It is positive that the Norwegian and Swedish net samples were representative with regard to the proportion of immigrants, as well as representative of regional dimensions like the size of municipality, county, and centrality/peripherality. The Norwegian net sample is representative with regard to gender, whilst there is an overrepresentation of women in the Swedish sample. In the net samples for Norway and Sweden, those in the age group 40-60 are overrepresented and those between

20 to 39 years are underrepresented. The data were weighed according to age and gender in order to remedy the underrepresentation of young workers and men. The data are weighed according to country of origin, so the Norwegian and Swedish samples have the same influence.

Questions about SP were answered by 2533 respondents who were either working, in parental leave, or in SA. Frequency of SP (the distribution of SP episodes) was measured by the following question: 'During the last 12 months, did you go to work despite feeling so ill that you should have taken sick leave?' A total of 1408 respondents reported SP, and they selected one or more alternatives from twelve options in response to the question: "Why did you go to work although you were ill?" The response options were chosen by the research team and based on former studies about SP and SA. Some of these reasons were negative (options 1 to 5), some were positive (options 8 to 11), and some can be interpreted as positive and negative (options 6 and 7).

Option 1: Because I am worried about being laid off

Option 2: Because I do not want to be considered lazy or unproductive

Option 3: Because I do not want to be suspected of cheating

Option 4: Because I am ashamed of being ill

Option 5: Because I can't afford taking sick leave

Option 6: Because nobody else is able to carry out my responsibilities

Option 7: Because I do not want to burden my colleagues

Option 8: Because I enjoy my work

Option 9: Because going to work was beneficial for my health

Option 10: Because I want to maintain my social network

Option 11: Because my pride depends on not taking sick leave

Option 12: There were other reasons that I went to work

Binomial logistic regression has been used to detect which factors influence reasons for SP. Binomial logistic regression is suitable for predicting the outcome of a categorical criterion variable that can take on only two possible outcomes. Nagelkerke R^2 is an often used version of the coefficient for

determination for logistic regression. Nagelkerke R^2 ranges from 0 to 1, and it provides a gauge of the substantive significance of the model.[22]

The independent variables are selected from former studies about factors influencing SP, and they include gender [1, 3, 4], age[4, 11], migratory status[23], education[1, 3, 11], income[1, 4, 11], position, type of employment[3, 4, 8, 15], and country. Some respondents did not answer all the independent variables, and 1270 respondents are included in the binomial logistic regression analyses.

- Age in years.
- Gender: male (reference category) and female.
- Migratory status: divided between natives (reference category), western immigrants (comprising Western Europe, Canada, USA, Australia and New Zealand) and non-western immigrants (comprising persons born in other countries).
- Education: divided between high educational attainment (reference category, Bachelor degree or higher) and low educational attainment.
- Income: divided between low income (reference category, -299,000 NOK/SEK), and medium/high income (300,000+ NOK/SEK). 300000 NOK is about 36000 Euros and 300000 SEK is about 33000 Euros.
- Type of employment: divided between employee in private sector (reference category), employee in public sector and self-employee.
- Employment position: divided between those that do not have a management position (reference category), and middle management/executives.
- Country: Sweden (reference category) and Norway-

The research was done in accordance with the rules set by the committees for medical research ethics in Norway and Sweden, was approved by the Norwegian Social Science Data Services, and conforms to the principles embodied in the Declaration of Helsinki.

Results

The response rate was 33% in both countries. In the last twelve month period, 56% of the Norwegian and Swedish respondents replied that they had gone to work even though it would have been reasonable to take sick leave. 37% reported one/two episodes of SP and 19% reported three or more episodes. In the question about reasons for SP, 32% of the respondents marked one option, 30% marked two options, and 31% marked three or more options, and 7% referred to "other reasons".

(TABLE 1 HERE)

Table 1 shows the distribution of reasons for SP in Norway and Sweden. In total, 43% report going to work while ill because they did not want to burden colleagues with their sick leave, 37% report that they enjoy their work, and 35% report that nobody else can carry out their responsibilities. Some respondents report that they practiced SP because they could not afford taking sick leave (21%), that their pride depended on not taking sick leave (17%), or that they did not want to be considered lazy or unproductive (16%). Small proportions of respondents reported health benefits (11%), suspected for cheating (8%), shame (6%), maintaining social network (4%), and risk for being laid off (4%).

There are major differences between Norwegian and Swedish respondents with regard to reasons for SP. Swedish respondents are overrepresented among those practicing SP because they cannot afford to be on sick leave (36% in Sweden and only 6% in Norway). Norwegian respondents are overrepresented among those pointing to various "benefits" of going to work despite illness, such as enjoying their work (44% in Norway and 30% in Sweden), their pride depends on not taking sick leave (24% vs 11%), and going to work is beneficial for their health (17% vs 4%). In addition, Norwegian respondents are overrepresented with regard to concern of being considered lazy or unproductive (21% vs 12%).

We have chosen to investigate which factors influence the four most often reported reasons for SP, as seen in table 1.

(TABLE 2 HERE)

Table 2 shows four logistic regression models. Model I concerns factors related to why people report that they take SP because they cannot afford taking sick leave has the best fit of the four models (Nagelke $R^2 = 0.30$). Significantly higher rates choosing this alternative include being a Swede, not having managerial responsibilities, having low education, and having low income. It is important to note that the most influential variable in Model I is "country" and not the level of income. Model II is about indispensability, and it shows almost the opposite profile and the estimated fit is the second best (Nagelke R2 = 0.14). Norwegians, middle managers and executives, highly educated persons, those with medium/high income, self-employed and private employed, have reported this reason to a significantly higher degree. Models III and IV both show relatively low degree of model fit (Nagelkerke $R^2 = 0.07$ and 0.06 respectively). Model III concerning the option "do not want to burden my colleagues" which was the most frequent reason given in Norway as well as in Sweden has been reported significantly more often among younger workers, among women, among natives and western immigrants, among self-employed and among managers. Model IV concerns the option "because I enjoy my work", and it was most frequently reported by natives, those with medium/high income, and by Norwegians.

Discussion

The most often reported reasons for SP were: do not want to burden my colleagues, enjoy my work, and nobody else is able to carry out my responsibilities. There were significant differences between respondents from the two countries: a higher proportion of Norwegian respondents point to the benefits of going to work despite illness, whilst a higher proportion of Swedish respondents report economic consequences of SP. Although the sample is quite large, the results must be interpreted with caution since the list of options for SP is incomplete. Another concern is the low response rate, which is similar to other level of living surveys in Norway and Sweden.

A majority of the respondents in Norway and Sweden have experienced SP in the past year, and this finding is in accordance with former studies of SP. [3 6 7 8 9 10 11] This study indicates that solidarity with colleagues, feeling indispensable, and to enjoy the work are the highest reported

reasons for SP. The results resemble studies in Denmark and the UK showing that consideration of colleagues is an often referred reason for SP,[19 24] and a study in UK indicating that SP occurs when work cannot wait or be delegated and could create extra work for colleagues.[6] Some previous studies on SP have focused on negative presence factors, [1 2 3 6 7 11 12 18 19 24] but our empirical results indicate that negative presence factors (lazy, shame, laid off and cheating) are reported by few respondents.

We expected to find differences with regard to the reasons for SP in Norway and Sweden since the level of SA is presently much higher in Norway compared to Sweden[25] and there are profound differences between the two countries in attitudes towards SA.[26] Moreover, sickness benefits in Norway are more generous than Sweden: a sick-listed person in Norway receives full compensation of the loss of income from the first day for a maximum of 364 days, whereas in Sweden the first day of SA is not compensated and from the second day the employees receive 80% compensation of the loss of income for a maximum of 364 days within a frame of 450 days.[27 28] Economic consequences of SA is the fourth reported reason for SP, and Swedes report that they cannot afford to be on sick leave more often than Norwegians. This finding correspond with former studies that point out that the direct economic consequences of SA can contribute to SP.[1 3 18 19]

The survey includes questions on relevant variables that enable us to control for "competing explanations" in our assessment of cross-country differences on reported reasons for SP. Educational attainment, income level and whether one has managerial responsibilities or not were influential factors for the most common reasons for SP. Managers and highly educated persons are likely to have a high degree of control over their work tasks, to feel time pressure, and to have supervisor responsibilities, and thus, they more often report that they practice SP because nobody else is able to carry out their responsibilities. Less educated persons, those with no management responsibilities, and low income more often report that they cannot afford to take sick leave, illustrating that the financial loss of being absent has a greater impact on these groups. In contrast, persons with high income more often report that they practice SP because they enjoy their work. Women and young workers more often report that they practice SP because they do not want to burden their colleagues. These findings could be an indication of differences in working conditions, for example that a higher share of women than men experience higher levels of cooperation or dependence in performing their work tasks. A

competing explanation could be that women and young workers are simply more concerned with relations at work as compared to men and older workers.

More than half of the workers in the study experienced SP in the previous year, but it might be objected that we do not know if there is a large variation between individual's in terms of threshold to report 'should have taken sick leave'. Future studies could investigate what symptoms people that experience SP refer to and whether there are large differences in the seriousness of their illness. Although the study indicates that differences in compensation system between the two countries, educational attainment and position are influential for reasons for SP, further research is needed to understand and explain such differences, as well as the consequences of SP in a shorter and longer term.

Response rates tend to be very low for postal questionnaires.[29] To increase the response rate, the length of the questionnaire was kept quite short (4 pages and 60 questions), a postal follow up including questionnaire was sent, the return envelope was pre-paid, and the information letter stressed the benefits of the study to society. The quality of postal addresses provided by Bisnode Match It and Scandinfo were good, since less than 300 letters were returned (3% of the gross sample). In retrospect, various strategies could have been considered to increase the response rate and improve the quality of our study: monetary or non-monetary incentives, personalised questionnaires and letters, contacting participants before sending the questionnaires, and more than one follow up.[29]

It is difficult to make conclusions about the accuracy of our survey, and the responses to questions on SP might have been influenced by recall bias. Another issue of concern is response bias, and some studies have shown that employees tend to under-report their SA.[30] It could also be that workers having experienced SP are represented in a higher proportion in the sample, and this could result in an overestimation of SP as compared to the situation in the population. It should be noted that the distribution of SP is in accordance with prior studies of SP at the national level.[1 8 10] It could be that data on SP suffer from under-reporting or over-reporting, but this study did not control for this possibility.

The fact that there are differences between Norway and Sweden where larger shares in Sweden and poor people claim that they use SP because they cannot afford to be on sick-leave may indicate that the Swedish social security system is unable to cover all individuals with a health problem in an equal way. Still, it is important to be clear that other reasons than the social security system could matter for these differences. When respondents report that they practice SP because they enjoy their work, this may generally be seen as unproblematic. However, several studies have found that frequent use of SP may lead to future health problems[4 12 13 14] and employers and occupational health services may therefore regard this as an early indicator of reduced productivity and later SA.

The authors declare that there is no conflict of interest.

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Table 1: Reported reasons for SP in Norway and Sweden, % and p value (Chi square tests)

Reasons for SP	Sweden	Norway	Total	p value
Because I do not want to burden my colleagues	41	46	43	0.059
Because I enjoy my work	30	44	37	0.000
Because nobody else is able to carry out my responsibilities	36	34	35	0.404
Because I can't afford taking sick leave	36	6	21	0.000
Because my pride depends on not taking sick leave	11	24	17	0.000
Because I do not want to be considered lazy or unproductive	12	21	16	0.000
Because going to work was beneficial for my health	4	17	11	0.000
Because I do not want to be suspected of cheating	8	8	8	0.689
Because I am ashamed of being ill	4	7	6	0.013
Because I want to maintain my social network	2	6	4	0.000
Because I am worried about being laid off	4	3	4	0.179

N = 1408 (Norway and Sweden)

Table 2: Factors of relevance to four most often reported reasons for SP among workers in Norway and Sweden, 2011, adjusted OR (95% Confidence Interval) and p value (** = significant at 0.01, * = significant at 0.05)

Factors	Model I Because I can't afford taking sick leave	Model II Because nobody else is able to carry out my responsibilities	Model III Because I do not want to burden my colleagues	Model IV Because I enjoy my work
Age (n = 1270)	0.99 (0.98 to 1.00)	0.99 (0.98 to 1.00)	0.99** (0.98 to 1.00)	1.00 (0.99 to 1.01)
Male (n = 660, 52%)	1.00	1.00	1.00	1.00
Female (n = 610, 48%)	0.79 (0.55 to 1.12)	0.88 (0.67 to 1.16)	1.75** (1.35 to 2.26)	0.95 (0.73 to 1.24)
Native (n = 1128, 89%)	1.00	1.00	1.00	1.00
Western (n = 70, 5%)	1.67 (0.91 to 3.01)	0.89 (0.51 to 1.54)	1.02 (0.62 to 1.69)	0.54* (0.31 to 0.95)
Non-western (n = 72, 6%)	1.59 (0.89 to 2.86)	1.25 (0.73 to 2.11)	0.49** (0.29 to 0.84)	0.79 (0.47 to 1.34)
High education (n = 437, 34%)	1.00	1.00	1.00	1.00
Low education (n = 833, 66%)	1.68** (1.16 to 2.44)	0.39** (0.30 to 0.52)	1.22 (0.93 to 1.58)	0.8 (0.65 to 1.11)
Medium/high income (n = 819, 64%)	1.00	1.00	1.00	1.00
Low income (n = 451, 36%)	2.57** (1.81 to 3.65)	0.74* (0.55 to 0.99)	0.98 (0.74 to 1.29)	0.67** (0.50 to 0.89)
Private employment (n = 686, 54%)	1.00	1.00	1.00	1.00
Self-employment (n = 134, 11%)	1.10 (0.65 to 1.84)	1.80** (1.20 to 2.69)	0.61* (0.40 to 0.93)	0.89 (0.59 to 1.34)
Public employment (n = 450, 35%)	1.27 (0.88 to 1.85)	0.57** (0.42 to 0.77)	1.25 (.96 to 1.64)	0.91 (0.69 to 1.20)
Non-management (n = 874, 69%)	1.00	1.00	1.00	1.00
Middle m./executives (N = 396, 31%)	0.54** (0.36 to 0.81)	2.19** (1.67 to 2.86)	0.73* (0.56 to 0.96)	1.13 (0.87 to 1.47)
Sweden (n = 618, 49%)	1.00	1.00	1.00	1.00
Norway (n = 651, 51%)	0.16** (0.10 to 0.22)	0.76* (0.59 to 0.98)	1.18 (0.92 to 1.51)	1.64** (1.28 to 2.09)
Constant	-0.98	0.89	0.96	0.54
Nagelkerke R^2	0.30	0.14	0.07	0.06

N = 1270

STROBE 2007 (v4) checklist of items to be included in reports of observational studies in epidemiology*

Checklist for cohort, case-control, and cross-sectional studies (combined)

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any pre-specified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5-6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	5-6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-8
Bias	9	Describe any efforts to address potential sources of bias	6-7, 12
Study size	10	Explain how the study size was arrived at	5-6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7-8
		(*b*) Describe any methods used to examine subgroups and interactions	7-8
		(*c*) Explain how missing data were addressed	8
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed	6, 12

		Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6-8
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6-8, 18
		(b) Indicate number of participants with missing data for each variable of interest	6-8, 18
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	9-10
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	9-10, 17-18
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	10-12
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	10, 12-13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10-13
Generalisability	21	Discuss the generalisability (external validity) of the study results	6-7, 13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	3, 5

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Positive and negative reasons for sickness presenteeism in Norway and Sweden

Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2013-004123.R2
Article Type:	Research
Date Submitted by the Author:	08-Jan-2014
Complete List of Authors:	Johansen, Vegard; Eastern Norway Research Institute, Aronsson, Gunnar; Stockhom University, Psychology Marklund, Staffan; Karolinska Institute, Insurance Medicine
Primary Subject Heading:	Sociology
Secondary Subject Heading:	Public health, Occupational and environmental medicine
Keywords:	PUBLIC HEALTH, STATISTICS & RESEARCH METHODS, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

Title page

Title

Positive and negative reasons for sickness presenteeism in Norway and Sweden

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Key Words

Sickness presenteeism, Survey, Norway, Sweden

Word count main text

3560

Structured abstract

Objectives: This paper investigates various reasons for sickness presenteeism (SP) , i.e. going to work despite illness. The research questions asked is: What are the main reported reasons for SP in Norway and Sweden?

Design: Cross-sectional survey in Norway and Sweden. Use of binomial logistic regression analysis.

Participants: A random sample of people aged between 20 to 60 years was obtained from complete and updated databases of the Norwegian and Swedish populations. A postal questionnaire was sent to the selected individuals, with response rate 33% (n= 2843). 2533 workers responded to questions about SP during the last 12 months.

Primary and secondary outcome measures: The paper informs about the distribution of reasons for SP in Norway and Sweden, selected by the respondents from a closed list. The paper also examines which factors influence the most often reported reasons for SP.

Results: 56% of the Norwegian and Swedish respondents experienced SP in the previous year. The most frequently reported reasons for SP include; not burden colleagues (43%), enjoy work (37%) and feeling indispensable (35%). A lower proportion of Norwegians state that they cannot afford taking sick leave (aOR 0.16 (95% CI 0.10-0.22)), whilst a higher proportion of Norwegians refer to that they enjoy their work (aOR = 1.64 (95% CI 1.28-2.09)). Women and young workers more often report that they do not want to burden their colleagues. Managers (aOR = 2.19 (95% CI 1.67-2.86)), highly educated persons and the self-employed more often report that they are indispensable.

Conclusions: Positive and negative reasons for SP are reported, and there significant differences between respondents from the two countries examined. The response rate is low and results must be interpreted with caution.

Study design

Cross-sectional study

Article summary

Article Focus

- This paper investigates various reasons for sickness presenteeism (SP)

- The research question is: What are the main reported reasons for SP in Norway and Sweden?

Key Messages

- The most often reported reasons for SP among Norwegian and Swedish workers include the desire to not put a burden on colleagues, enjoy work and feeling indispensable

- Cross-country differences in reported reasons for SP are revealed

- Education level, income level and employment position also influence reasons for SP

Strengths and Limitations

- The sample is quite large; 2533 workers of which 1408 workers experienced SP

- The respondents could choose from twelve positive and negative reasons for SP

- The response rate is low, and the responses to SP may suffer from recall bias

Main text

Introduction

Sickness presenteeism (SP) refers to going to work despite illness.[1 2] This concept has been a subject of steadily increasing interest since it emerged in the 1990s.[3 4 5] Several studies in different countries and among different occupational groups have shown that large shares of employees have gone to work when they ought to stay at home for health reasons. A British study indicated that more than 80% of general practitioners, hospital physicians and senior accountants engaged in SP,[6] and a similar proportion of SP was reported in a Norwegian study of physicians.[7] More than 70% of the Danish core work force reported one or more episodes of SP in a year,[8] and in a study of a Canadian public service organization, more than 70% had SP.[9] In the Netherlands, about 60% of a national sample of workers had attended work even when they felt sick.[10] Finally, 50% of the respondents in a Swedish labour force survey reported SP in 1997,[1] and in a study from 2000, the proportion was 70%.[11]

Previous studies on SP have focused on three issues: the association between SP and sickness absence (SA), the consequences of SP on the productivity of organisations, and the causes of SP.[2 4] First, the association between absenteeism and presenteeism is strongly positive.[1 3 4] Moreover, research results indicate that SP can cause serious health problems at a later stage[4 12 13 14] and that several episodes of SP during the previous year is a risk factor for future SA.[15]

Second, American researchers have investigated the consequences of SP on the productivity of organizations. It is claimed that SP causes much more aggregate productivity loss than SA,[16] and that managing SP effectively could be a competitive advantage.[17] It seems that SP can have an impact due to reduced work capacity, but the effects on the quantity and quality of the work performed by personnel with SP should be subject to further investigation.

Third, the causes of SP have been investigated in various Nordic studies. A Swedish study identifies different types of factors related to SP, such as reporting variable/rather poor/poor health status, facing personal financial demands, and work-related demands such as staff replacement and

time pressure.[11] A Finnish study concludes that SP is sensitive to working-time arrangements, and that those working in the private sector report SP more often than those in the public sector.[3] A Norwegian study argues that there is a positive correlation between job satisfaction and rates of SP.[7] In a Danish study it is found that poor health, heavy work, work vs. family conflicts, social support, latitude in decision making and obesity are characteristics among those reporting SP.[4]

Most empirical studies on SP are focused on negative presence factors such as health problems, economic considerations, job insecurity, high workload, inability of others to take over duties, inability to adjust work demands, the need to complete unfinished jobs after returning from sick leave, negative sanctions from colleagues or management , workplace culture, work ethics, feelings of moral obligation, and job satisfaction.[1 2 3 6 7 11 12 18 19] The present study investigates both "positive" presence factors (e.g. "enjoy my work", "going to work was beneficial for my health" etc.) and "negative" presence factors (e.g. "can't afford taking sick leave", "I am worried about being laid off" etc.).[12 19] Using data from a cross-country study, this paper describes the distribution of twelve reasons for SP in Norway and Sweden. The research question asked is: *What are the main reported reasons for SP in Norway and Sweden?*

Methods

This study uses data from a survey in Norway and Sweden from 2011. The purpose was to study "a normal population`s" attitudes to and experiences with SA and SP. We carried out a postal survey since this was the only financially viable option for our cross-country study. The Norwegian survey was administered by Eastern Norway Research Institute and the Swedish survey was administered by ScandInfo. The data collection was part of a research project called "Social factors contributing to sickness absence" (SOFAC) funded by the Research Council of Norway. The Research Council of Norway had no role in study design; in the collection, analysis and interpretation of the data; in the writing of the article; or in the decision to submit for publication. The data collection took two months; it began in the beginning of March and ended in the beginning of May.

In both countries the process of selecting the gross sample was simple random sampling from the population between 20 to 60 years of age. The potential participants included people working full-

time and part-time, on parental leave and on sick leave, as well as unemployed people, students and receivers of disability pension. The selection of the gross sample in Norway was done by Bisnode Match It, and they have a complete and updated database of the Norwegian population. The selection of the gross sample in Sweden was done by ScandInfo, and they have a complete and updated database of the Swedish population. 4900 Norwegians were asked to participate in the survey and 1594 responded. 3800 Swedes were asked to participate and 1249 responded.

The information letter stated that the aim of the survey was to map experiences and attitudes to sick leave among representative samples in Norway and Sweden. It stated that the study was approved by the Data Protection Official for Research (Norwegian Social Science Data Services), and that all respondents were anonymous to the research team. Direct personal data was not collected, and none of the respondents could be identified through a combination of background information since we asked few background variables. Finally, the information letter included information about e-mail and telephone to the researchers in the project.

The questionnaire was designed particularly for the SOFAC-project. In the pilot study in Norway, respondents used about 15 minutes to fill out the questionnaire. The questionnaire included questions on a few background variables, about the employment situation, experiences with sick leave, experiences with SP, attitudes to sick leave in general, and attitudes to sick leave due to psychological illness and skeletal-muscular disease. The full questionnaire is available upon request to the research team.

Statistics Norway and Statistics Sweden are sources of factual information about the populations in Norway and Sweden, and distributions of sex, age, immigration, education level, county, centrality/peripherality, municipality size are presented annually and can be accessed online.[20] [21] To test for non-response bias, we compared known values from the population between 20 and 60 years of age (potential participants) with the values that prevail in the subgroup that answered the questionnaire. It is positive that the Norwegian and Swedish net samples were representative with regard to the proportion of immigrants, as well as representative of regional dimensions like the size of municipality, county, and centrality/peripherality. The Norwegian net sample is representative with regard to gender, whilst there is an overrepresentation of women in the Swedish sample. In the net

samples for Norway and Sweden, those in the age group 40-60 are overrepresented and those between 20 to 39 years are underrepresented. The data were weighed according to age and gender in order to remedy the underrepresentation of young workers and men. The data are weighed according to country of origin, so the Norwegian and Swedish samples have the same influence.

Questions about SP were answered by 2533 respondents who were either working, in parental leave, or in SA. Frequency of SP (the distribution of SP episodes) was measured by the following question: 'During the last 12 months, did you go to work despite feeling so ill that you should have taken sick leave?' A total of 1408 respondents reported SP, and they selected one or more alternatives from twelve options in response to the question: "Why did you go to work although you were ill?" The response options were chosen by the research team and based on former studies about SP and SA. Some of these reasons were negative (options 1 to 5), some were positive (options 8 to 11), and some can be interpreted as positive and negative (options 6 and 7).

Option 1: Because I am worried about being laid off

Option 2: Because I do not want to be considered lazy or unproductive

Option 3: Because I do not want to be suspected of cheating

Option 4: Because I am ashamed of being ill

Option 5: Because I can't afford taking sick leave

Option 6: Because nobody else is able to carry out my responsibilities

Option 7: Because I do not want to burden my colleagues

Option 8: Because I enjoy my work

Option 9: Because going to work was beneficial for my health

Option 10: Because I want to maintain my social network

Option 11: Because my pride depends on not taking sick leave

Option 12: There were other reasons that I went to work

Binomial logistic regression has been used to detect which factors influence the four most often reported reasons for SP. Binomial logistic regression is suitable for predicting the outcome of a

categorical criterion variable that can take on only two possible outcomes. Nagelkerke R^2 is an often used version of the coefficient for determination for logistic regression. Nagelkerke R^2 ranges from 0 to 1, and it provides a gauge of the substantive significance of the model.[22]

The independent variables are selected from former studies about factors influencing SP, and they include gender [1, 3, 4], age[4, 11], migratory status[23], education[1, 3, 11], income[1, 4, 11], position, type of employment[3, 4, 8, 15], and country. Some respondents did not answer all the independent variables, and 1270 respondents are included in the binomial logistic regression analyses. In addition to having proven importance in previous studies of factors related to SP, the independent variables are included in the multivariate regression models since they have statistical significance for one or more of the dependent variables (i.e. the four most often reported reasons for SP). All these variables were included in the model building process:

- Age in years.
- Gender: male (reference category) and female.
- Migratory status: divided between natives (reference category), western immigrants (comprising Western Europe, Canada, USA, Australia and New Zealand) and non-western immigrants (comprising persons born in other countries).
- Education: divided between high educational attainment (reference category, Bachelor degree or higher) and low educational attainment.
- Income: divided between low income (reference category, -299,000 NOK/SEK), and medium/high income (300,000+ NOK/SEK). 300000 NOK is about 36000 Euros and 300000 SEK is about 33000 Euros.
- Type of employment: divided between employee in private sector (reference category), employee in public sector and self-employee.
- Employment position: divided between those that do not have a management position (reference category), and middle management/executives.
- Country: Sweden (reference category) and Norway.

The research was done in accordance with the rules set by the committees for medical research ethics in Norway and Sweden, was approved by the Norwegian Social Science Data Services, and conforms to the principles embodied in the Declaration of Helsinki.

Results

The response rate was 33% in both countries. In the last twelve month period, 56% of the Norwegian and Swedish respondents replied that they had gone to work even though it would have been reasonable to take sick leave during the last 12 months. 37% reported one/two episodes of SP and 19% reported three or more episodes. In the question about reasons for SP, 32% of the respondents marked one option, 30% marked two options, and 31% marked three or more options, and 7% referred to "other reasons".

(TABLE 1 HERE)

Table 1 shows the distribution of reasons for SP in Norway and Sweden. In total, 43% report going to work while ill because they did not want to burden colleagues with their sick leave, 37% report that they enjoy their work, and 35% report that nobody else can carry out their responsibilities. Some respondents report that they practiced SP because they could not afford taking sick leave (21%), that their pride depended on not taking sick leave (17%), or that they did not want to be considered lazy or unproductive (16%). Small proportions of respondents reported health benefits (11%), suspected for cheating (8%), shame (6%), maintaining social network (4%), and risk for being laid off (4%).

There are major differences between Norwegian and Swedish respondents with regard to reasons for SP. Swedish respondents are overrepresented among those practicing SP because they cannot afford to be on sick leave (36% in Sweden and only 6% in Norway). Norwegian respondents are overrepresented among those pointing to various "benefits" of going to work despite illness, such as enjoying their work (44% in Norway and 30% in Sweden), their pride depends on not taking sick leave (24% vs 11%), and going to work is beneficial for their health (17% vs 4%). In addition,

Norwegian respondents are overrepresented with regard to concern of being considered lazy or unproductive (21% vs 12%).

We have chosen to investigate which factors influence the four most often reported reasons for SP, as seen in table 1.

(TABLE 2 HERE)

Table 2 shows four logistic regression models. Model I concerns factors related to why people report that they take SP because they cannot afford taking sick leave has the best fit of the four models (Nagelkerke $R^2 = 0.30$). Significantly higher rates choosing this alternative include being a Swede, not having managerial responsibilities, having low education, and having low income. It is important to note that the most influential variable in Model I is "country" and not the level of income. Model II is about indispensability, and it shows almost the opposite profile and the estimated fit is the second best (Nagelkerke $R^2 = 0.14$). Norwegians, middle managers and executives, highly educated persons, those with medium/high income, self-employed and private employed, have reported this reason to a significantly higher degree. Models III and IV both show relatively low degree of model fit (Nagelkerke $R^2 = 0.07$ and 0.06 respectively). Model III concerning the option "do not want to burden my colleagues" which was the most frequent reason given in Norway as well as in Sweden has been reported significantly more often among younger workers, among women, among natives and western immigrants, among self-employed and among managers. Model IV concerns the option "because I enjoy my work", and it was most frequently reported by natives, those with medium/high income, and by Norwegians.

Discussion

The most often reported reasons for SP were: do not want to burden my colleagues, enjoy my work, and nobody else is able to carry out my responsibilities. There were significant differences between respondents from the two countries: a higher proportion of Norwegian respondents point to the benefits of going to work despite illness, whilst a higher proportion of Swedish respondents report

economic consequences of SP. Although the sample is quite large, the results must be interpreted with caution since the list of options for SP is incomplete. Another concern is the low response rate. We could suspect that workers with strong opinions or knowledge or experiences with SA and SP have been more willing to spend time answering our questionnaire than those who do not. If workers having experienced SP are represented in a higher proportion in the sample, this could result in an overestimation of SP as compared to the situation in the population. Moreover, if the participants make a non-representative sample, this questions the distribution of reported reasons for SP. It should be noted that the distribution of SP is in accordance with prior studies of SP at the national level.[1 8 10]

A majority of the respondents in Norway and Sweden have experienced SP in the past year, and this finding is in accordance with former studies of SP. [3 6 7 8 9 10 11] This study indicates that solidarity with colleagues, feeling indispensable, and to enjoy the work are the highest reported reasons for SP. The results resemble studies in Denmark and the UK showing that consideration of colleagues is an often referred reason for SP,[19 24] and a study in UK indicating that SP occurs when work cannot wait or be delegated and could create extra work for colleagues.[6] Some previous studies on SP have focused on negative presence factors, [1 2 3 6 7 11 12 18 19 24] but our empirical results indicate that negative presence factors (lazy, shame, laid off and cheating) are reported by few respondents.

We expected to find differences with regard to the reasons for SP in Norway and Sweden since the level of SA is presently much higher in Norway compared to Sweden[25] and there are profound differences between the two countries in attitudes towards SA.[26] Moreover, sickness benefits in Norway are more generous than Sweden: a sick-listed person in Norway receives full compensation of the loss of income from the first day for a maximum of 364 days, whereas in Sweden the first day of SA is not compensated and from the second day the employees receive 80% compensation of the loss of income for a maximum of 364 days within a frame of 450 days.[27 28] Economic consequences of SA is the fourth reported reason for SP, and Swedes report that they cannot afford to be on sick leave more often than Norwegians. This finding correspond with former studies that point out that the direct economic consequences of SA can contribute to SP.[1 3 18 19]

The survey includes questions on relevant variables that enable us to control for "competing explanations" in our assessment of cross-country differences on reported reasons for SP. Educational attainment, income level and whether one has managerial responsibilities or not were influential factors for the most common reasons for SP. Managers and highly educated persons are likely to have a high degree of control over their work tasks, to feel time pressure, and to have supervisor responsibilities, and thus, they more often report that they practice SP because nobody else is able to carry out their responsibilities. Less educated persons, those with no management responsibilities, and low income more often report that they cannot afford to take sick leave, illustrating that the financial loss of being absent has a greater impact on these groups. In contrast, persons with high income more often report that they practice SP because they enjoy their work. Women and young workers more often report that they practice SP because they do not want to burden their colleagues. These findings could be an indication of differences in working conditions, for example that a higher share of women than men experience higher levels of cooperation or dependence in performing their work tasks. A competing explanation could be that women and young workers are simply more concerned with relations at work as compared to men and older workers.

More than half of the workers in the study experienced SP in the previous year, but it might be objected that we do not know if there is a large variation between individual's in terms of threshold to report 'should have taken sick leave'. Future studies could investigate what symptoms people that experience SP refer to and whether there are large differences in the seriousness of their illness. Although the study indicates that differences in compensation system between the two countries, educational attainment and position are influential for reasons for SP, further research is needed to understand and explain such differences, as well as the consequences of SP in a shorter and longer term.

Response rates tend to be very low for postal questionnaires.[29] To increase the response rate, the length of the questionnaire was kept quite short (4 pages and 60 questions), a postal follow up including questionnaire was sent, the return envelope was pre-paid, and the information letter stressed the benefits of the study to society. The quality of postal addresses provided by Bisnode Match It and Scandinfo were good, since less than 300 letters were returned (3% of the gross sample). In retrospect,

various strategies could have been considered to increase the response rate and improve the quality of our study: monetary or non-monetary incentives, personalised questionnaires and letters, contacting participants before sending the questionnaires, and more than one follow up.[29]

It is difficult to make conclusions about the accuracy of our survey, and the responses to questions on SP might have been influenced by recall bias. Another issue of concern is response bias, and some studies have shown that employees tend to under-report their SA.[30] It could be that data on SP suffer from under-reporting or over-reporting, but this study did not control for this possibility.

The fact that there are differences between Norway and Sweden where larger shares in Sweden and poor people claim that they use SP because they cannot afford to be on sick-leave may indicate that the Swedish social security system is unable to cover all individuals with a health problem in an equal way. Still, it is important to be clear that other reasons than the social security system could matter for these differences. When respondents report that they practice SP because they enjoy their work, this may generally be seen as unproblematic. However, several studies have found that frequent use of SP may lead to future health problems[4 12 13 14] and employers and occupational health services may therefore regard this as an early indicator of reduced productivity and later SA.

The authors declare that there is no conflict of interest.

Funding Statement

This work was supported by the Norwegian Research Council.

Contributorship Statement

Research Professor Vegard Johansen, Professor Gunnar Aronsson and Professor Staffan Marklund are authors of the manuscript. They designed and monitored the data collection, cleaned and analysed the data, and wrote the paper.

Competing Interests Statement

The authors declare that there is no conflict of interest.

Data Sharing Statement

No additional data

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Table 1: Reported reasons* for sickness presenteeism during the last 12 months among random samples of Norwegian and Swedish workers between 20 to 60 years of age, 2011. Figures are percentages and p value (Chi square tests). The data were weighed according to age, gender and country of origin.

Reasons for SP	Sweden (n = 686)	Norway (n = 722)	Total (n = 1408)	p value
Because I do not want to burden my colleagues	41	46	43	0.059
Because I enjoy my work	30	44	37	0.000
Because nobody else is able to carry out my responsibilities	36	34	35	0.404
Because I can't afford taking sick leave	36	6	21	0.000
Because my pride depends on not taking sick leave	11	24	17	0.000
Because I do not want to be considered lazy or unproductive	12	21	16	0.000
Because going to work was beneficial for my health	4	17	11	0.000
Because I do not want to be suspected of cheating	8	8	8	0.689
Because I am ashamed of being ill	4	7	6	0.013
Because I want to maintain my social network	2	6	4	0.000
Because I am worried about being laid off	4	3	4	0.179

*The reported reasons for sickness presenteeism was selected by the respondents from a closed list in the questionnaire.

Table 2: Factors of relevance to the four most often reported reasons for sickness presenteeism among workers between 20 to 60 years of age in Norway and Sweden, 2011. Adjusted odds ratio values are shown with 95% Confidence Interval and p value (** = significant at 0.01, * = significant at 0.05). The data were weighed according to age, gender and country of origin.

Factors	Model I Because I can't afford taking sick leave	Model II Because nobody else is able to carry out my responsibilities	Model III Because I do not want to burden my colleagues	Model IV Because I enjoy my work
Age (n = 1270)	0.99 (0.98 to 1.00)	0.99 (0.98 to 1.00)	0.99** (0.98 to 1.00)	1.00 (0.99 to 1.01)
Male (n = 660, 52%)	1.00	1.00	1.00	1.00
Female (n = 610, 48%)	0.79 (0.55 to 1.12)	0.88 (0.67 to 1.16)	1.75** (1.35 to 2.26)	0.95 (0.73 to 1.24)
Native (n = 1128, 89%)	1.00	1.00	1.00	1.00
Western (n = 70, 5%)	1.67 (0.91 to 3.01)	0.89 (0.51 to 1.54)	1.02 (0.62 to 1.69)	0.54* (0.31 to 0.95)
Non-western (n = 72, 6%)	1.59 (0.89 to 2.86)	1.25 (0.73 to 2.11)	0.49** (0.29 to 0.84)	0.79 (0.47 to 1.34)
High education (n = 437, 34%)	1.00	1.00	1.00	1.00
Low education (n = 833, 66%)	1.68** (1.16 to 2.44)	0.39** (0.30 to 0.52)	1.22 (0.93 to 1.58)	0.8 (0.65 to 1.11)
Medium/high income (n = 819, 64%)	1.00	1.00	1.00	1.00
Low income (n = 451, 36%)	2.57** (1.81 to 3.65)	0.74* (0.55 to 0.99)	0.98 (0.74 to 1.29)	0.67** (0.50 to 0.89)
Private employment (n = 686, 54%)	1.00	1.00	1.00	1.00
Self-employment (n = 134, 11%)	1.10 (0.65 to 1.84)	1.80** (1.20 to 2.69)	0.61* (0.40 to 0.93)	0.89 (0.59 to 1.34)
Public employment (n = 450, 35%)	1.27 (0.88 to 1.85)	0.57** (0.42 to 0.77)	1.25 (.96 to 1.64)	0.91 (0.69 to 1.20)
Non-management (n = 874, 69%)	1.00	1.00	1.00	1.00
Middle m./executives (N = 396, 31%)	0.54** (0.36 to 0.81)	2.19** (1.67 to 2.86)	0.73* (0.56 to 0.96)	1.13 (0.87 to 1.47)
Sweden (n = 618, 49%)	1.00	1.00	1.00	1.00
Norway (n = 651, 51%)	0.16** (0.10 to 0.22)	0.76* (0.59 to 0.98)	1.18 (0.92 to 1.51)	1.64** (1.28 to 2.09)
Constant	-0.98	0.89	0.96	0.54
Nagelkerke R^2	0.30	0.14	0.07	0.06

N = 1270

Title page

Title

Positive and negative reasons for sickness presenteeism in Norway and Sweden

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Key Words

Sickness presenteeism, Survey, Norway, Sweden

Word count main text

3560

Structured abstract

Objectives: This paper investigates various reasons for sickness presenteeism (SP) , i.e. going to work despite illness. The research questions asked is: What are the main reported reasons for SP in Norway and Sweden?

Design: Cross-sectional survey in Norway and Sweden. Use of binomial logistic regression analysis.

Participants: A random sample of people aged between 20 to 60 years was obtained from complete and updated databases of the Norwegian and Swedish populations. A postal questionnaire was sent to the selected individuals, with response rate 33% (n= 2843). 2533 workers responded to questions about SP during the last 12 months.

Primary and secondary outcome measures: The paper informs about the distribution of reasons for SP in Norway and Sweden, selected by the respondents from a closed list. The paper also examines which factors influence the most often reported reasons for SP.

Results: 56% of the Norwegian and Swedish respondents experienced SP in the previous year. The most frequently reported reasons for SP include; not burden colleagues (43%), enjoy work (37%) and feeling indispensable (35%). A lower proportion of Norwegians state that they cannot afford taking sick leave (aOR 0.16 (95% CI 0.10-0.22)), whilst a higher proportion of Norwegians refer to that they enjoy their work (aOR = 1.64 (95% CI 1.28-2.09)). Women and young workers more often report that they do not want to burden their colleagues. Managers (aOR = 2.19 (95% CI 1.67-2.86)), highly educated persons and the self-employed more often report that they are indispensable.

Conclusions: Positive and negative reasons for SP are reported, and there significant differences between respondents from the two countries examined. The response rate is low and results must be interpreted with caution.

Study design

Cross-sectional study

Article summary

Article Focus

- This paper investigates various reasons for sickness presenteeism (SP)

- The research question is: What are the main reported reasons for SP in Norway and Sweden?

Key Messages

- The most often reported reasons for SP among Norwegian and Swedish workers include the desire to not put a burden on colleagues, enjoy work and feeling indispensable

- Cross-country differences in reported reasons for SP are revealed

- Education level, income level and employment position also influence reasons for SP

Strengths and Limitations

- The sample is quite large; 2533 workers of which 1408 workers experienced SP

- The respondents could choose from twelve positive and negative reasons for SP

- The response rate is low, and the responses to SP may suffer from recall bias

Contributorship Statement

Research Professor Vegard Johansen, Professor Gunnar Aronsson and Professor Staffan Marklund are authors of the manuscript. They designed and monitored the data collection, cleaned and analysed the data, and wrote the paper.

Funding Statement

This work was supported by the Norwegian Research Council.

Competing Interests Statement

The authors declare that there is no conflict of interest.

Main text

Introduction

Sickness presenteeism (SP) refers to going to work despite illness.[1 2] This concept has been a subject of steadily increasing interest since it emerged in the 1990s.[3 4 5] Several studies in different countries and among different occupational groups have shown that large shares of employees have gone to work when they ought to stay at home for health reasons. A British study indicated that more than 80% of general practitioners, hospital physicians and senior accountants engaged in SP,[6] and a similar proportion of SP was reported in a Norwegian study of physicians.[7] More than 70% of the Danish core work force reported one or more episodes of SP in a year,[8] and in a study of a Canadian public service organization, more than 70% had SP.[9] In the Netherlands, about 60% of a national sample of workers had attended work even when they felt sick.[10] Finally, 50% of the respondents in a Swedish labour force survey reported SP in 1997,[1] and in a study from 2000, the proportion was 70%.[11]

Previous studies on SP have focused on three issues: the association between SP and sickness absence (SA), the consequences of SP on the productivity of organisations, and the causes of SP.[2 4] First, the association between absenteeism and presenteeism is strongly positive.[1 3 4] Moreover, research results indicate that SP can cause serious health problems at a later stage[4 12 13 14] and that several episodes of SP during the previous year is a risk factor for future SA.[15]

Second, American researchers have investigated the consequences of SP on the productivity of organizations. It is claimed that SP causes much more aggregate productivity loss than SA,[16] and that managing SP effectively could be a competitive advantage.[17] It seems that SP can have an impact due to reduced work capacity, but the effects on the quantity and quality of the work performed by personnel with SP should be subject to further investigation.

Third, the causes of SP have been investigated in various Nordic studies. A Swedish study identifies different types of factors related to SP, such as reporting variable/rather poor/poor health status, facing personal financial demands, and work-related demands such as staff replacement and time pressure.[11] A Finnish study concludes that SP is sensitive to working-time arrangements, and that those working in the private sector report SP more often than those in the public sector.[3] A Norwegian study argues that there is a positive correlation between job satisfaction and rates of SP.[7] In a Danish

study it is found that poor health, heavy work, work vs. family conflicts, social support, latitude in decision making and obesity are characteristics among those reporting SP.[4]

Most empirical studies on SP are focused on negative presence factors such as health problems, economic considerations, job insecurity, high workload, inability of others to take over duties, inability to adjust work demands, the need to complete unfinished jobs after returning from sick leave, negative sanctions from colleagues or management , workplace culture, work ethics, feelings of moral obligation, and job satisfaction.[1 2 3 6 7 11 12 18 19] The present study investigates both "positive" presence factors (e.g. "enjoy my work", "going to work was beneficial for my health" etc.) and "negative" presence factors (e.g. "can't afford taking sick leave", "I am worried about being laid off" etc.).[12 19] Using data from a cross-country study, this paper describes the distribution of twelve reasons for SP in Norway and Sweden. The research question asked is: *What are the main reported reasons for SP in Norway and Sweden?*

Methods

This study uses data from a survey in Norway and Sweden from 2011. The purpose was to study "a normal population`s" attitudes to and experiences with SA and SP. We carried out a postal survey since this was the only financially viable option for our cross-country study. The Norwegian survey was administered by Eastern Norway Research Institute and the Swedish survey was administered by ScandInfo. The data collection was part of a research project called "Social factors contributing to sickness absence" (SOFAC) funded by the Research Council of Norway. The Research Council of Norway had no role in study design; in the collection, analysis and interpretation of the data; in the writing of the article; or in the decision to submit for publication. The data collection took two months; it began in the beginning of March and ended in the beginning of May.

In both countries the process of selecting the gross sample was simple random sampling from the population between 20 to 60 years of age. The potential participants included people working full-time and part-time, on parental leave and on sick leave, as well as unemployed people, students and receivers of disability pension. The selection of the gross sample in Norway was done by Bisnode Match It, and they have a complete and updated database of the Norwegian population. The selection

of the gross sample in Sweden was done by ScandInfo, and they have a complete and updated database of the Swedish population. 4900 Norwegians were asked to participate in the survey and 1594 responded. 3800 Swedes were asked to participate and 1249 responded.

The information letter stated that the aim of the survey was to map experiences and attitudes to sick leave among representative samples in Norway and Sweden. It stated that the study was approved by the Data Protection Official for Research (Norwegian Social Science Data Services), and that all respondents were anonymous to the research team. Direct personal data was not collected, and none of the respondents could be identified through a combination of background information since we asked few background variables. Finally, the information letter included information about e-mail and telephone to the researchers in the project.

The questionnaire was designed particularly for the SOFAC-project. In the pilot study in Norway, respondents used about 15 minutes to fill out the questionnaire. The questionnaire included questions on a few background variables, about the employment situation, experiences with sick leave, experiences with SP, attitudes to sick leave in general, and attitudes to sick leave due to psychological illness and skeletal-muscular disease. The full questionnaire is available upon request to the research team.

Statistics Norway and Statistics Sweden are sources of factual information about the populations in Norway and Sweden, and distributions of sex, age, immigration, education level, county, centrality/peripherality, municipality size are presented annually and can be accessed online.[20] [21] To test for non-response bias, we compared known values from the population between 20 and 60 years of age (potential participants) with the values that prevail in the subgroup that answered the questionnaire. It is positive that the Norwegian and Swedish net samples were representative with regard to the proportion of immigrants, as well as representative of regional dimensions like the size of municipality, county, and centrality/peripherality. The Norwegian net sample is representative with regard to gender, whilst there is an overrepresentation of women in the Swedish sample. In the net samples for Norway and Sweden, those in the age group 40-60 are overrepresented and those between 20 to 39 years are underrepresented. The data were weighed according to age and gender in order to

remedy the underrepresentation of young workers and men. The data are weighed according to country of origin, so the Norwegian and Swedish samples have the same influence.

Questions about SP were answered by 2533 respondents who were either working, in parental leave, or in SA. Frequency of SP (the distribution of SP episodes) was measured by the following question: 'During the last 12 months, did you go to work despite feeling so ill that you should have taken sick leave?' A total of 1408 respondents reported SP, and they selected one or more alternatives from twelve options in response to the question: "Why did you go to work although you were ill?" The response options were chosen by the research team and based on former studies about SP and SA. Some of these reasons were negative (options 1 to 5), some were positive (options 8 to 11), and some can be interpreted as positive and negative (options 6 and 7).

Option 1: Because I am worried about being laid off

Option 2: Because I do not want to be considered lazy or unproductive

Option 3: Because I do not want to be suspected of cheating

Option 4: Because I am ashamed of being ill

Option 5: Because I can't afford taking sick leave

Option 6: Because nobody else is able to carry out my responsibilities

Option 7: Because I do not want to burden my colleagues

Option 8: Because I enjoy my work

Option 9: Because going to work was beneficial for my health

Option 10: Because I want to maintain my social network

Option 11: Because my pride depends on not taking sick leave

Option 12: There were other reasons that I went to work

Binomial logistic regression has been used to detect which factors influence the four most often reported reasons for SP. Binomial logistic regression is suitable for predicting the outcome of a categorical criterion variable that can take on only two possible outcomes. Nagelkerke R^2 is an often

used version of the coefficient for determination for logistic regression. Nagelkerke R^2 ranges from 0 to 1, and it provides a gauge of the substantive significance of the model.[22]

The independent variables are selected from former studies about factors influencing SP, and they include gender [1, 3, 4], age[4, 11], migratory status[23], education[1, 3, 11], income[1, 4, 11], position, type of employment[3, 4, 8, 15], and country. Some respondents did not answer all the independent variables, and 1270 respondents are included in the binomial logistic regression analyses. In addition to having proven importance in previous studies of factors related to SP, the independent variables are included in the multivariate regression models since they have statistical significance for one or more of the dependent variables (i.e. the four most often reported reasons for SP). All these variables were included in the model building process:

- Age in years.
- Gender: male (reference category) and female.
- Migratory status: divided between natives (reference category), western immigrants (comprising Western Europe, Canada, USA, Australia and New Zealand) and non-western immigrants (comprising persons born in other countries).
- Education: divided between high educational attainment (reference category, Bachelor degree or higher) and low educational attainment.
- Income: divided between low income (reference category, -299,000 NOK/SEK), and medium/high income (300,000+ NOK/SEK). 300000 NOK is about 36000 Euros and 300000 SEK is about 33000 Euros.
- Type of employment: divided between employee in private sector (reference category), employee in public sector and self-employee.
- Employment position: divided between those that do not have a management position (reference category), and middle management/executives.
- Country: Sweden (reference category) and Norway.

The research was done in accordance with the rules set by the committees for medical research ethics in Norway and Sweden, was approved by the Norwegian Social Science Data Services, and conforms to the principles embodied in the Declaration of Helsinki.

Results

The response rate was 33% in both countries. In the last twelve month period, 56% of the Norwegian and Swedish respondents replied that they had gone to work even though it would have been reasonable to take sick leave during the last 12 months. 37% reported one/two episodes of SP and 19% reported three or more episodes. In the question about reasons for SP, 32% of the respondents marked one option, 30% marked two options, and 31% marked three or more options, and 7% referred to "other reasons".

(TABLE 1 HERE)

Table 1 shows the distribution of reasons for SP in Norway and Sweden. In total, 43% report going to work while ill because they did not want to burden colleagues with their sick leave, 37% report that they enjoy their work, and 35% report that nobody else can carry out their responsibilities. Some respondents report that they practiced SP because they could not afford taking sick leave (21%), that their pride depended on not taking sick leave (17%), or that they did not want to be considered lazy or unproductive (16%). Small proportions of respondents reported health benefits (11%), suspected for cheating (8%), shame (6%), maintaining social network (4%), and risk for being laid off (4%).

There are major differences between Norwegian and Swedish respondents with regard to reasons for SP. Swedish respondents are overrepresented among those practicing SP because they cannot afford to be on sick leave (36% in Sweden and only 6% in Norway). Norwegian respondents are overrepresented among those pointing to various "benefits" of going to work despite illness, such as enjoying their work (44% in Norway and 30% in Sweden), their pride depends on not taking sick leave (24% vs 11%), and going to work is beneficial for their health (17% vs 4%). In addition,

Norwegian respondents are overrepresented with regard to concern of being considered lazy or unproductive (21% vs 12%).

We have chosen to investigate which factors influence the four most often reported reasons for SP, as seen in table 1.

(TABLE 2 HERE)

Table 2 shows four logistic regression models. Model I concerns factors related to why people report that they take SP because they cannot afford taking sick leave has the best fit of the four models (Nagelkerke $R^2 = 0.30$). Significantly higher rates choosing this alternative include being a Swede, not having managerial responsibilities, having low education, and having low income. It is important to note that the most influential variable in Model I is "country" and not the level of income. Model II is about indispensability, and it shows almost the opposite profile and the estimated fit is the second best (Nagelkerke $R^2 = 0.14$). Norwegians, middle managers and executives, highly educated persons, those with medium/high income, self-employed and private employed, have reported this reason to a significantly higher degree. Models III and IV both show relatively low degree of model fit (Nagelkerke $R^2 = 0.07$ and 0.06 respectively). Model III concerning the option "do not want to burden my colleagues" which was the most frequent reason given in Norway as well as in Sweden has been reported significantly more often among younger workers, among women, among natives and western immigrants, among self-employed and among managers. Model IV concerns the option "because I enjoy my work", and it was most frequently reported by natives, those with medium/high income, and by Norwegians.

Discussion

The most often reported reasons for SP were: do not want to burden my colleagues, enjoy my work, and nobody else is able to carry out my responsibilities. There were significant differences between respondents from the two countries: a higher proportion of Norwegian respondents point to the benefits of going to work despite illness, whilst a higher proportion of Swedish respondents report

economic consequences of SP. Although the sample is quite large, the results must be interpreted with caution since the list of options for SP is incomplete. Another concern is the low response rate. We could suspect that workers with strong opinions or knowledge or experiences with SA and SP have been more willing to spend time answering our questionnaire than those who do not. If workers having experienced SP are represented in a higher proportion in the sample, this could result in an overestimation of SP as compared to the situation in the population. Moreover, if the participants make a non-representative sample, this questions the distribution of reported reasons for SP. It should be noted that the distribution of SP is in accordance with prior studies of SP at the national level.[1 8 10]

A majority of the respondents in Norway and Sweden have experienced SP in the past year, and this finding is in accordance with former studies of SP. [3 6 7 8 9 10 11] This study indicates that solidarity with colleagues, feeling indispensable, and to enjoy the work are the highest reported reasons for SP. The results resemble studies in Denmark and the UK showing that consideration of colleagues is an often referred reason for SP,[19 24] and a study in UK indicating that SP occurs when work cannot wait or be delegated and could create extra work for colleagues.[6] Some previous studies on SP have focused on negative presence factors, [1 2 3 6 7 11 12 18 19 24] but our empirical results indicate that negative presence factors (lazy, shame, laid off and cheating) are reported by few respondents.

We expected to find differences with regard to the reasons for SP in Norway and Sweden since the level of SA is presently much higher in Norway compared to Sweden[25] and there are profound differences between the two countries in attitudes towards SA.[26] Moreover, sickness benefits in Norway are more generous than Sweden: a sick-listed person in Norway receives full compensation of the loss of income from the first day for a maximum of 364 days, whereas in Sweden the first day of SA is not compensated and from the second day the employees receive 80% compensation of the loss of income for a maximum of 364 days within a frame of 450 days.[27 28] Economic consequences of SA is the fourth reported reason for SP, and Swedes report that they cannot afford to be on sick leave more often than Norwegians. This finding correspond with former studies that point out that the direct economic consequences of SA can contribute to SP.[1 3 18 19]

The survey includes questions on relevant variables that enable us to control for "competing explanations" in our assessment of cross-country differences on reported reasons for SP. Educational attainment, income level and whether one has managerial responsibilities or not were influential factors for the most common reasons for SP. Managers and highly educated persons are likely to have a high degree of control over their work tasks, to feel time pressure, and to have supervisor responsibilities, and thus, they more often report that they practice SP because nobody else is able to carry out their responsibilities. Less educated persons, those with no management responsibilities, and low income more often report that they cannot afford to take sick leave, illustrating that the financial loss of being absent has a greater impact on these groups. In contrast, persons with high income more often report that they practice SP because they enjoy their work. Women and young workers more often report that they practice SP because they do not want to burden their colleagues. These findings could be an indication of differences in working conditions, for example that a higher share of women than men experience higher levels of cooperation or dependence in performing their work tasks. A competing explanation could be that women and young workers are simply more concerned with relations at work as compared to men and older workers.

More than half of the workers in the study experienced SP in the previous year, but it might be objected that we do not know if there is a large variation between individual's in terms of threshold to report 'should have taken sick leave'. Future studies could investigate what symptoms people that experience SP refer to and whether there are large differences in the seriousness of their illness. Although the study indicates that differences in compensation system between the two countries, educational attainment and position are influential for reasons for SP, further research is needed to understand and explain such differences, as well as the consequences of SP in a shorter and longer term.

Response rates tend to be very low for postal questionnaires.[29] To increase the response rate, the length of the questionnaire was kept quite short (4 pages and 60 questions), a postal follow up including questionnaire was sent, the return envelope was pre-paid, and the information letter stressed the benefits of the study to society. The quality of postal addresses provided by Bisnode Match It and Scandinfo were good, since less than 300 letters were returned (3% of the gross sample). In retrospect,

various strategies could have been considered to increase the response rate and improve the quality of our study: monetary or non-monetary incentives, personalised questionnaires and letters, contacting participants before sending the questionnaires, and more than one follow up.[29]

It is difficult to make conclusions about the accuracy of our survey, and the responses to questions on SP might have been influenced by recall bias. Another issue of concern is response bias, and some studies have shown that employees tend to under-report their SA.[30] It could be that data on SP suffer from under-reporting or over-reporting, but this study did not control for this possibility.

The fact that there are differences between Norway and Sweden where larger shares in Sweden and poor people claim that they use SP because they cannot afford to be on sick-leave may indicate that the Swedish social security system is unable to cover all individuals with a health problem in an equal way. Still, it is important to be clear that other reasons than the social security system could matter for these differences. When respondents report that they practice SP because they enjoy their work, this may generally be seen as unproblematic. However, several studies have found that frequent use of SP may lead to future health problems[4 12 13 14] and employers and occupational health services may therefore regard this as an early indicator of reduced productivity and later SA.

The authors declare that there is no conflict of interest.

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Table 1: Reported reasons* for sickness presenteeism during the last 12 months among random samples of Norwegian and Swedish workers between 20 to 60 years of age, 2011. Figures are percentages and p value (Chi square tests). The data were weighed according to age, gender and country of origin.

Reasons for SP	Sweden (n = 686)	Norway (n = 722)	Total (n = 1408)	p value
Because I do not want to burden my colleagues	41	46	43	0.059
Because I enjoy my work	30	44	37	0.000
Because nobody else is able to carry out my responsibilities	36	34	35	0.404
Because I can't afford taking sick leave	36	6	21	0.000
Because my pride depends on not taking sick leave	11	24	17	0.000
Because I do not want to be considered lazy or unproductive	12	21	16	0.000
Because going to work was beneficial for my health	4	17	11	0.000
Because I do not want to be suspected of cheating	8	8	8	0.689
Because I am ashamed of being ill	4	7	6	0.013
Because I want to maintain my social network	2	6	4	0.000
Because I am worried about being laid off	4	3	4	0.179

*The reported reasons for sickness presenteeism was selected by the respondents from a closed list in the questionnaire.

Table 2: Factors of relevance to the four most often reported reasons for sickness presenteeism among workers between 20 to 60 years of age in Norway and Sweden, 2011. Adjusted odds ratio values are shown with 95% Confidence Interval and p value (** = significant at 0.01, * = significant at 0.05). The data were weighed according to age, gender and country of origin.

Factors	Model I Because I can't afford taking sick leave	Model II Because nobody else is able to carry out my responsibilities	Model III Because I do not want to burden my colleagues	Model IV Because I enjoy my work
Age (n = 1270)	0.99 (0.98 to 1.00)	0.99 (0.98 to 1.00)	0.99** (0.98 to 1.00)	1.00 (0.99 to 1.01)
Male (n = 660, 52%)	1.00	1.00	1.00	1.00
Female (n = 610, 48%)	0.79 (0.55 to 1.12)	0.88 (0.67 to 1.16)	1.75** (1.35 to 2.26)	0.95 (0.73 to 1.24)
Native (n = 1128, 89%)	1.00	1.00	1.00	1.00
Western (n = 70, 5%)	1.67 (0.91 to 3.01)	0.89 (0.51 to 1.54)	1.02 (0.62 to 1.69)	0.54* (0.31 to 0.95)
Non-western (n = 72, 6%)	1.59 (0.89 to 2.86)	1.25 (0.73 to 2.11)	0.49** (0.29 to 0.84)	0.79 (0.47 to 1.34)
High education (n = 437, 34%)	1.00	1.00	1.00	1.00
Low education (n = 833, 66%)	1.68** (1.16 to 2.44)	0.39** (0.30 to 0.52)	1.22 (0.93 to 1.58)	0.8 (0.65 to 1.11)
Medium/high income (n = 819, 64%)	1.00	1.00	1.00	1.00
Low income (n = 451, 36%)	2.57** (1.81 to 3.65)	0.74* (0.55 to 0.99)	0.98 (0.74 to 1.29)	0.67** (0.50 to 0.89)
Private employment (n = 686, 54%)	1.00	1.00	1.00	1.00
Self-employment (n = 134, 11%)	1.10 (0.65 to 1.84)	1.80** (1.20 to 2.69)	0.61* (0.40 to 0.93)	0.89 (0.59 to 1.34)
Public employment (n = 450, 35%)	1.27 (0.88 to 1.85)	0.57** (0.42 to 0.77)	1.25 (.96 to 1.64)	0.91 (0.69 to 1.20)
Non-management (n = 874, 69%)	1.00	1.00	1.00	1.00
Middle m./executives (N = 396, 31%)	0.54** (0.36 to 0.81)	2.19** (1.67 to 2.86)	0.73* (0.56 to 0.96)	1.13 (0.87 to 1.47)
Sweden (n = 618, 49%)	1.00	1.00	1.00	1.00
Norway (n = 651, 51%)	0.16** (0.10 to 0.22)	0.76* (0.59 to 0.98)	1.18 (0.92 to 1.51)	1.64** (1.28 to 2.09)
Constant	-0.98	0.89	0.96	0.54
Nagelkerke R^2	0.30	0.14	0.07	0.06

N = 1270

STROBE 2007 (v4) checklist of items to be included in reports of observational studies in epidemiology*

Checklist for cohort, case-control, and cross-sectional studies (combined)

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4-5
Objectives	3	State specific objectives, including any pre-specified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5-6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-6
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	5-6
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	7-8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7-8
Bias	9	Describe any efforts to address potential sources of bias	6-7, 12
Study size	10	Explain how the study size was arrived at	5-6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7-8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7-8
		(*b*) Describe any methods used to examine subgroups and interactions	7-8
		(*c*) Explain how missing data were addressed	8
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed	6, 12

		Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	
		(*e*) Describe any sensitivity analyses	
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6-8
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6-8, 18
		(b) Indicate number of participants with missing data for each variable of interest	6-8, 18
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	9-10
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	9-10, 17-18
		(*b*) Report category boundaries when continuous variables were categorized	
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	
Discussion			
Key results	18	Summarise key results with reference to study objectives	10-12
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	10, 12-13
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10-13
Generalisability	21	Discuss the generalisability (external validity) of the study results	6-7, 13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	3, 5

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.