BMJ Open

Prevalence, associated factors and reasons for sickness presenteeism: A nationally representative study of the salaried workers in Spain, 2016

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2017-021212
Article Type:	Research
Date Submitted by the Author:	18-Dec-2017
Complete List of Authors:	Navarro, Albert; Autonomous University of Barcelona, Research Group on Psychosocial Risks, Organization of Work and Health (POWAH); Autonomous University of Barcelona, Biostatistics Unit, Faculty of Medicine Salas-Nicás, Sergio; Autonomous University of Barcelona, Research Group on Psychosocial Risks, Organization of Work and Health (POWAH); Autonomous University of Barcelona, Biostatistics Unit, Facuty of Medicine Moncada, Salvador; Union Institute of Work, Environment and Health (ISTAS), Reference Centre on Work Organisation and Health Llorens, Clara; Autonomous University of Barcelona, Research Group on Psychosocial Risks, Organization of Work and Health (POWAH); Union Institute of Work, Environment and Health (ISTAS), Reference Centre on Work Organisation and Health Molinero-Ruiz, Emilia; Public Health Agency of Barcelona, Epidemiology Service
Keywords:	Sickness presenteeism, Population-based study, Spain

Prevalence, associated factors and reasons for sickness presenteeism: A nationally representative study of the salaried workers in Spain, 2016

Albert Navarro[1,2], Sergio Salas-Nicás[1,2], Salvador Moncada[3], Clara Llorens[1,3,4], Emilia Molinero-Ruiz[5]

Affiliation of authors:

[1] Research group on Psychosocial risks, Organization of Work and Health (POWAH). Autonomous University of Barcelona (UAB). Cerdanyola del Vallès, Spain.

[2] Biostatistics Unit. Department of Paediatrics, Obstetrics & Gynaecology, Preventive Medicine and Public Health. Autonomous University of Barcelona (UAB), Cerdanyola del Vallès, Spain.

[3] Union Institute of Work, Environment and Health (ISTAS), Reference Centre on Work Organisation and Health, Barcelona, Spain.

[4] Sociology Department. Faculty of Socialogy and Political Sicences. Autonomous University of Barcelona (UAB), Cerdanyola del Vallès, Spain.

[5] Epidemiology Service, Public Health Agency of Barcelona, Spain.

Corresponding author: Albert Navarro. Biostatistics Unit. Faculty of Medicine. Autonomous University of Barcelona (UAB), 08193 Cerdanyola del Vallès, Spain. e-mail: albert.navarro@uab.cat

Keywords: Sickness presenteeism, Population-based study, Spain.

Word count abstract: 242 / **Word count text:** 2074

Abstract

Objectives: The first aim of this study was to estimate the prevalence and associated factors of SP in Spain, among the overall salaried population and excluding the "healthy" workers. The second aim was to identify the main reasons for SP.

Design: Population-based cross-sectional study.

Setting: Salaried population in Spain.

Participants: Data was obtained from the third Spanish Psychosocial Risks Survey (2016), carried out between October and December 2016, n=1615.

Main outcome measures: Self-reported episodes of SP and their reasons.

Results: 23.0% (95CI%=19.2-26.8) of the workers exhibited SP, whereas among those manifesting having had some health problem in the preceding year, the figure was 53.0% (95%CI: 46.9-59.1). The factors associated with SP vary depending on whether we take all workers into account, or restrict the analysis to those who had health problems in the preceding year. The most common reason for SP was "not want to burden my colleagues", 45.7% (95CI%=37.3-54.4).

Conclusions: The estimated frequency of SP in Spain seems to be rather lower than other countries, such as the Scandinavian countries. SP can be studied taking all workers into account, or only those with health problems. The first approach could represent a mixture between health status and exercise of workers' rights, while the second could explain specifically the exercise of rights. The reason "To be worried about being laid off" was much more common than the estimated in Sweden or Norway, whereas the reason "Because I enjoyed my work" was less frequent.

Strengths and limitations of this study

- First study presenting the different factors associated with SP depending on the population analysed (overall or excluding "healthy" workers)
- The sample size and the representativeness at population level.
- The survey includes an important number of sociodemographic and occupational variables that enable us to stratify to obtain relevant findings.
- It is based on a cross-sectional design. Then, we cannot establish any causal relationship.

Background

The concept of presenteeism has been a topic of interest since the 1980s in the business and social science literature. In these contexts, presenteeism is basically interested in the economic impact because of the loss of productivity of people who attend work despite being ill or feeling like they should have taken sick leave.[1 2] A second approach, developed especially by European researchers, is focused in the act of atteding work while sick and its effects on worker's health.[2 3] In this approach, sickness presenteeism (SP) commonly replaces the term "presenteeism".

SP is defined as the fact of working despite being ill[4] and it should be considered an important public health issue due to its association with a range of health problems,[5–10] with future episodes of sickness absence,[7 8 11 12] and because it has important implications for employing organizations, and theory in the domain of attendance at work.[13] It is interesting to note that the majority of studies estimating "prevalences" of SP, do so on the working population not excluding the "healthy" workers, who by definition can not exhibit SP.

While still relatively scarce, evidence regarding this problem is becoming more common. The vast majority of research on SP has been developed using an equivalent question to that formulated by Aronsson et al:[4] *"Has it happened over the previous 12 months that you have gone to work despite feeling that you really should have taken sick leave due to your state of health?"*. In Spain, however, it doesn't exist any results based on a similar question. In fact, to the best of our knowledge, the quantitative evidence on SP in Spain are only limited to one study published in 2010 that reported certain differences between Spanish-born and immigrant workers[14] and from the European Working Conditions Surveys (EWCS).[3]

Regarding the specific reasons for SP, to our best knowledge, the published literature are restricted to two papers in Norway and Sweden, one of them in general working population[15] and the other in long-term sick-listed subjects.[16] In addition, there are other papers restricting their analyses to health care professionals.[17–19]

This study had two aims. The first aim was to estimate the prevalence and associated factors of SP in Spain, among the overall salaried population and excluding the "healthy" workers. The second aim was to identify the main reasons for SP among the workers who had experiencied some episode.

Methods

Study population and design

Population-based cross-sectional study. Data was obtained from the third edition of the Spanish Psychosocial Risks Survey (ERP2016 in its Spanish acronym), carried out between October and December 2016, and which is based on a representative sample of the salaried population in Spain. The specific sample for this study corresponds to n=1615 workers who had undertaken paid work for at least one hour during the week prior to their interview, and who had worked for at least nine months during the last year. This sample represents an overall population of 13 543 087 salaried workers. The data were analyzed anonymously and all procedures were approved by the Ethics Committee on Animal and Human Experimentation of the Autonomous University of Barcelona (CEEAH/3445).

Sickness presenteeism

Self-reported SP was measured using the question: *"In the last 12 months, how many times have you worked even though you thought you should have taken sick-leave due to your state of health?",* the answer being the total number of times. If the answer to the previous question was "zero", the worker was then asked *"You have said none. Was this because you were never sick, or because you took sick leave whenever you were sick?".* For purposes of comparability the answer was categorised as proposed by Aronsson[20] into: "no, never", "yes, once", "2-5 times", "more than 5 times", "I have not been sick during the past 12 months". The prevalence of SP was estimated using the usual criterion[4] which considers that a worker exhibits "presenteeism" if they went to work twice or more during the preceding year even though "sick".

Reasons for SP

Each worker who had one or more episodes of SP answered the question *"Why did you go to work even if you thought that you should have taken a sick leave?"* with ten non-exclusive options (see Table 1).

Statistical analysis

Frequency distributions of SP were elaborated for the whole population and stratified by covariate. We estimated 95%CI for the prevalence of SP, as well as the corresponding prevalence ratios (aPR), adjusted for sex, age and occupational class, by fitting robust Poisson models. All results are presented: a) in relation to the entire sample; b) excluding "healthy" workers (those anwering "I have not been sick during the past 12 months"). Furthermore, we present the percentages and their 95%CI of each reason for SP.

Sampling weights were calculated to account for the probability of a worker being selected and to comply with the sex and occupational class distribution of the Spanish wage-earning population. All analyses were conducted, taking sample design into account, using the 'svy' command of the STATA statistical package, version 11.0 (Stata Corp., College Station, TX, USA).

Results

Table 2 presents the results related with all workers in the sample studied, where it may be seen that 71.7% did not report any episodes of presenteeism, and 4.7% reported more than 5 episodes. The prevalence of SP, based on the usual criterion of "two or more episodes" is 23.0% (95CI%: 19.2-26.8). The prevalence is clearly lower among workers aged 16 to 24 years, 9.8% (95%CI: 4.3-15.4), than among the rest; workers who have been in their job for less than one year have a lower prevalence, 14.0% (95%CI: 8.0-19.9), especially in comparison to those who have been in the job for 1-5 years (aPR=1.84; 95%CI: 1.16-2.93); among those working more than 48 hours/week the prevalence reaches 35.6% (95%CI: 20.6-50.5), i.e. 1.62 times higher than those who work between 35 and 40 hours; compared to workers with a fixed salary, the prevalence also rises among workers whose salary is partly fixed, partly variable (aPR=1.57; 95%CI: 1.05-2.34) or entirely variable (aPR=1.93; 95%CI: 1.30-2.88); workers whose salary is the only source of household income have a higher prevalence, 29,4% (95%CI: 23.4-35.4); finally, workers in firms which made downsizing in the last year have higher prevalence (aPR=1.55; 95%CI: 1.15-2.10).

Table 3 presents results only for workers who manifested having felt, at some time in the past 12 months, that they should have stayed home for health reasons (43.4% of the total). In this

case, 34.7% of the workers did not report any episode and 10.0% reported more than 5. The prevalence of SP (two or more episodes) rises to 53.0% (95%CI: 46.9-59.1), and the majority of differences between groups observed on Table 1 are moderated or disappear, with the following exceptions: higher prevalence among workers without a contract (aPR=1.51; 95%CI: 1.02-2.23), among those working more than 48 hours weekly (aPR=1.41; 95%CI: 1.08-1.83) and among those whose salary was entirely variable (aPR=1.33; 95%CI: 0.99-1.79).

9.9% of the workers with SP episodes do not choose any reason among the ten that were proposed, and 32.9% four or more. The average number is 2.9±2.9. Table 1 shows the frequencies of the reasons for SP. Almost half of the workers that have experienced SP report "not want to burden my colleagues", the most frequent reason, 45.7% (95%CI: 37.3-54.4). The economic motives are the third reason, 35.9% (95%CI: 29.4-42.9), above the concern to be laid off, 27.5% (21.3-34.6). 11.8% (7.6-17.8) of the workers with SP episodes went to work because they thought it was beneficial to their health.

Discussion

This study allows for first time to obtain the estimated prevalences of SP in Spain using a similar question to that formulated by Aronsson,[4] which is widely used in research on SP. Furthermore, to the best our knowledge, this paper is the first that shows the different factors associated with SP depending on the population analysed (overall or excluding "healthy" workers).

The frequency of SP estimated when we analyse all wage-earning population is lower than that obtained in studies conducted in Scandinavian countries, using an equivalent question and the same criteria for definition of SP. Thus, studies conducted in Sweden[7 20] and Denmark[21] show that the percentage of workers with two or more SP episodes exceeds 50%, wehereas this figure in our study was less than half. One must be cautious however, given that the points in time do not coincide, and in some cases the degree of representativeness of samples in which estimates are made is not clear. One must also be aware of the difficulty of comparing studies between countries, since the influence which different systems of social protection (unemployment, exercise of workers' rights, etc.) may have on episodes of SP must be taken into account, as well as cultural aspects related with the perception of being incapable of working, or related with work ethics differing between countries.

In addition to applying the approach most widely used in the literature which estimates the proportion of workers with SP out of the total number of workers, we have opted to complement the results reporting findings only for workers who manifested having health problems during the preceding year. If we accept "Going to work despite judging that one should have reported in sick",[4] or any equivalent expression as the definition of SP, it is clear that to be "at risk of being presenteeist" the necessary previous condition is having been "sick", and hence it seems that the denominator over which to estimate the prevalence of presenteeism should be the latter, rather than the total number of workers. Of the few authors taking this approach, d'Errico,[3] using EWCS data, situates Spain slightly below the EU27 average, and above other mediterranean countries such as Italy or Greece, and clearly below UK and the Scandinavian countries.

Depending on the approach used, we observe differences in terms of both magnitudes and associated factors. Thus, taking all workers into account, it would appear that the phenomenon under study is strongly associated with variables such as age or seniority, both being related with health status (age directly, and seniority indirectly through age). When we exclude "healthy" workers, the statistical relevance of these factors disappears, and the rest of the variables which were associated either lose their significance (which happens for workers whose salary is mixed, workers whose salary represents the totality of household income, or workers in firms that have experienced downsizing in the last year), or their strength of association is moderated (the case of working more than 48 hours/week, or having a entirely variable salary). In this case, not having a work-contract emerges as the factor most strongly associated, which was not significantly associated when we took all workers into account. It is worth mentioning that Agudelo-Suárez[14] found this association in Spain, exclusively for foreign-born workers living in Spain for two or more years. If SP can be in the most part seen as the impossibility of exercising the right of taking sick leave, then not having a contract means not having the legal right.

The most common reason for SP was "not want to burden my colleagues", as in other studies conducted in Norway and Sweden.[15] [16] We found more than one out of four workers expressing to be worried about being laid off, percentage strongly higher than the estimated in Sweden, 4%, or Norway, 3%. Instead, the reason "Because I enjoyed my work" was lower than the obtained in those countries (30% and 44% in Sweden and Norway, respectively).[15]

This study has some limitations. It is based on a cross-sectional design. Then, we cannot establish any causal relationship and the associations that we found should be tested in

longitudinal studies. However, the sample size and the representativeness at population level are notable strengths of our study.

In our opinion, studying SP in relation to the totality of workers, or restricting to those reporting health problems, represents the study of two different phenomena. The first approach describes a phenomenon which is a mixture of health status and exercising of rights (where perhaps the former has more weight); the second approach focuses specifically on the exercise of the right to take sick leave. On the other hand, the studying of SP should include not only the estimation of its frequency but also the reported reasons. Two populations with the same prevalence but remarkable different distribution of reasons could capture distinct phenomena and, consecuently, different preventive measures should be applied.

Authors' Contributions

AN was the responsible for analysing the data and for drafting the first version of the manuscript. SSN was involved in the bibliographic search. AN, SSN, SM, CL and EMR were involved in the data collection, study design, interpretation of data and critical review of the manuscript.

Competing Interests

The authors declare that they have no competing interests.

Ethics approval

The data were analysed anonymously and all procedures were approved by the Ethics

Committee on Animal and Human Experimentation of the Autonomous University of Barcelona (CEEAH/3445).

Funding

This study was financially supported by two grants of the Instituto de Salud Carlos III, Spanish Ministry of Economy, Industry and Competitiveness [PI15/00161 and PI15/00858]

Data Sharing

No additional data are available.

References

1. Widera E, Chang A, Chen HL. Presenteeism: a public health hazard. *J Gen Intern Med* 2010;**25**:1244–7.
2. Johns G. Presenteeism in the workplace: A review and research agenda. *J Organ Behav* 2010;**31**:519–42.
3. d'Errico A, Leombruni R. Work Organization , Exposure to Workplace Hazards and Sickness Presenteeism in the European Employed Population. *Am J Ind Med* 2016;**59**:57–72.
4. Aronsson G, Gustafsson K, Dallner M. Sick but yet at work. An empirical study of sickness presenteeism. *J Epidemiol Community Heal* 2000;**54**:502–9.
5. Bergström G, Bodin L, Hagberg J, et al. Does sickness presenteeism have an impact on future general health? *Int Arch Occup Environ Health* 2009;**82**:1179–90.
6. Aronsson G, Gustafsson K, Mellner C. Sickness presence, sickness absence, and self-reported health and symptoms. *Int J Work Heal Manag* 2011;**4**:228–43.
7. Gustafsson K, Marklund S. Consequences of sickness presence and sickness absence on health and work ability: a Swedish prospective cohort study. *Int J Occup Med Environ Health* 2011;**24**:153–65.
8. Taloyan M, Aronsson G, Leineweber C, et al. Sickness presenteeism predicts suboptimal self-rated health and sickness absence: a nationally representative study of the Swedish working population. *PLoS One* 2012;**7**:e44721.
9. Conway PM, Hogh A, Rugulies R, et al. Is sickness presenteeism a risk factor for depression? A Danish 2-year follow-up study. *J Occup Environ Med* 2014;**56**:595–603.
10. Skagen K, Collins AM. The consequences of sickness presenteeism on health and wellbeing over time: A systematic review. *Soc Sci Med* 2016;**161**:169–77.

11. Hansen CD, Andersen JH. Sick at work--a risk factor for long-term sickness absence at a later date? *J Epidemiol Community Health* 2009;**63**:397–402.

12. Bergström G, Bodin L, Hagberg J, et al. Sickness presenteeism today, sickness absenteeism tomorrow? A prospective study on sickness presenteeism and future sickness absenteeism. *J Occup Environ Med* 2009;**51**:629–38.

13. Johns G. Attendance dynamics at work: The antecedents and correlates of presenteeism, absenteeism, and productivity loss. *J Occup Health Psychol* 2011;**16**:483–500.

14. Agudelo-Suárez AA, Benavides FG, Felt E, et al. Sickness presenteeism in Spanish-born and immigrant workers in Spain. *BMC Public Health* 2010;**10**:791.

15. Johansen V, Aronsson G, Marklund S. Positive and negative reasons for sickness presenteeism in Norway and Sweden: a cross-sectional survey. *BMJ Open* 2014;**4**:e004123.

16. Marklund S, Aronsson G, Johansen V, et al. Previous sickness presence among long-term sick-listed in Norway and Sweden: A retrospective study of prevalence and self-reported reasons. *Int J Soc Welf* 2015;**24**:376–87.

17. Tan PC, Robinson G, Jayathissa S, et al. Coming to work sick: a survey of hospital doctors in New Zealand. *J New Zeal Med Assoc* 2014;**127**:23–35.

18. Gustafsson Senden M, Schenck-Gustafsson K, Fridner A. Gender differences in Reasons for Sickness Presenteeism - a study among GPs in a Swedish health care organization. *Ann Occup Environ Med* 2016;**28**:50.

19. Rebmann T, Turner JA, Kunerth AK. Presenteeism Attitudes and Behavior Among Missouri Kindergarten to Twelfth Grade (K–12) School Nurses. *J Sch Nurs* 2016;**32**:407–15.

20. Aronsson G, Gustafsson K. Sickness presenteeism: prevalence, attendance-pressure

factors, and an outline of a model for research. *J Occup Environ Med* 2005;**47**:958–66.

21. Hansen CD, Andersen JH. Going ill to work--what personal circumstances, attitudes and work-related factors are associated with sickness presenteeism? *Soc Sci Med* 2008;**67**:956–64.

Table 1. Reasons given for SP.

Why did you go to work even if you thought that you should have taken a sick leave?	Percentage (95%CI), %
Because I did not want to burden my colleagues	45.7 (37.3-54.4)
Because I would have accumulated the job	38.5 (31.5-45.9)
Because I could not afford it for economic reasons	35.9 (29.4-42.9)
Because no one else could do my job	35.5 (29.8-41.7)
Because I did not want to be considered lazy or unproductive	31.6 (24.7-39.4)
Because I was worried about being laid off	27.5 (21.3-34.6)
Because I was worried about being subjected to some other kind of retaliation	26.3 (20.0-33.7)
Because I enjoyed my work	21.4 (15.4-29.0)
Because I did not want to be considered weak	20.0 (15.1-26.1)
Because going to work was beneficial for my health	11.8 (7.6-17.8)

Table 2. Distribution of covariates, episodes, prevalences of presenteeism and prevalence ratios adjusted by sex, age and occupational class (aPR). All workers.

	Weigthed distribution, %	SP episodes distribution, %				Prevalence (95%CI), %	aPR (95%CI)
		0	1	2-5	>5		
Sex							
Male	51.9	74.4	4.0	17.9	3.7	21.6 (16.5-26.7)	1
Female	48.1	68.7	6.8	18.7	5.8	24.4 (19.3-29.5)	1.09 (0.81-1.47)
Age							
16-24	8.9	80.3	9.9	9.1	0.7	9.8 (4.3-15.4)	1
25-34	19.8	74.3	5.3	16.4	4.1	20.4 (14.1-26.7)	2.02 (1.07-3.79)
35-44	28.5	69.7	3.3	22.5	4.5	27.0 (19.3-34.7)	2.62 (1.39-4.92)
45-54	29.3	68.6	5.2	18.7	7.6	26.3 (19.2-33.3)	2.55 (1.43-4.55)
> 54	13.6	73.0	7.2	17.1	2.7	19.8 (11.6-27.9)	1.93 (0.94-3.95)
Country of birth							
Spanish or OECD	88.4	71.2	5.4	18.9	4.5	23.4 (19.3-27.5)	1
Non-OECD	11.6	75.5	4.4	13.7	6.4	20.0 (12.7-27.4)	0.95 (0.64-1.40)
Occupational class							
No manual	47.1	68.9	5.1	20.5	5.6	26.0 (20.1-31.9)	1
Manual	52.9	74.2	5.5	16.3	4.0	20.2 (16.3-24.2)	0.79 (0.61-1.04)
Seniority (years)							
<1	13.8	82.4	3.6	10.0	4.0	14.0 (8.0-19.9)	1
[1,5)	27.2	66.6	6.6	21.8	5.0	26.8 (20.1-33.5)	1.84 (1.16-2.93)
[5,10)	16.1	72.0	5.8	18.4	3.9	22.2 (14.1-30.3)	1.47 (0.85-2.56)
>= 10	42.8	71.3	4.9	18.6	5.1	23.7 (18.4-29.1)	1.45 (0.88-2.40)
Weekly working hours							
< 20	6.5	76.4	7.0	12.2	4.3	16.6 (7.7-25.4)	0.75 (0.44-1.26)
20-34	15.6	72.6	7.0	14.8	5.6	20.4 (12.2-28.5)	0.86 (0.56-1.32)
35-40	61.4	71.9	4.7	18.6	4.9	23.4 (18.8-28.0)	1
41-48	8.6	78.7	3.6	13.4	4.3	17.7 (6.6-28.8)	0.80 (0.42-1.51)
> 48	8.0	57.1	7.3	32.7	2.8	35.6 (20.6-50.5)	1.62 (1.04-2.54)
Salary structure							
Fixed	83.8	74.0	5.2	17.2	3.6	20.8 (16.8-24.8)	1
Mixed	10.7	61.1	6.7	25.4	6.8	32.2 (20.8-43.7)	1.57 (1.05-2.34)
Variable	5.5	56.7	5.3	20.0	18.0	38.0 (22.5-53.5)	1.93 (1.30-2.88)
Contribution of worker's wage-total household income							
<= 40%	21.4	74.1	6.1	14.7	5.1	19.8 (13.6-26.0)	1
41-60%	34.3	75.9	4.5	14.6	5.0	19.5 (13.9-25.2)	0.99 (0.65-1.50)
61-99%	11.9	74.5	4.5	16.6	4.5	21.1 (11.7-30.4)	1.11 (0.67-1.85)
100%	32.4	64.6	6.0	25.1	4.3	29.4 (23.4-35.4)	1.53 (1.05-2.23)
Employment status							
Permanent	76.2	71.5	5.0	18.9	4.7	23.6 (19.4-27.7)	1
Temporary	20.1	72.3	6.9	16.8	4.0	20.8 (14.3-27.4)	0.95 (0.68-1.33)
No contract	3.7	73.2	4.5	13.6	8.8	22.3 (6.7-38.0)	1.03 (0.50-2.13)
Downsizing							
No	78.8	74.3	5.0	16.9	3.8	20.7 (16.3-25.0)	1
Yes	21.2	60.7	7.0	23.7	8.5	32.2 (25.5-39.0)	1.55 (1.15-2.10)
Overall		71.7	5.3	18.3	4.7	23.0 (19.2-26.8)	

Table 3. Distribution of covariates, episodes, prevalences of presenteeism and prevalence ratios adjusted by sex, age and occupational class (aPR). Excluding workers who have not been sick during the past 12 months.

	Weigthed	SP episodes distribution, %				Prevalence	
	distribution, %	0	1	2-5	>5	(95%CI), %	aPR (95% CI)
Sex							
Male	49.2	37.8	9.6	43.5	9.1	52.6 (43.6-61.5)	1
Female	50.8	31.7	14.9	40.7	12.6	53.4 (45.4-61.3)	1.01 (0.80-1.26)
Age							
16-24	4.9	17.1	41.6	38.3	3.1	41.4 (21.1-61.6)	1
25-34	20.2	42.0	11.9	37.0	9.2	46.1 (31.8-60.4)	1.11 (0.63-1.95)
35-44	29.8	33.2	7.3	49.7	9.8	59.5 (49.2-69.8)	1.42 (0.83-2.43)
45-54	32.7	35.2	10.6	38.6	15.6	54.2 (42.7-65.6)	1.30 (0.78-2.15)
> 54	12.5	32.0	18.2	43.0	6.9	49.8 (36.8-62.8)	1.20 (0.68-2.13)
Country of birth							
Spanish or OECD	90.0	34.8	12.3	42.8	10.2	53.0 (46.4-59.5)	1
Non-OECD	10.0	34.5	11.7	36.6	17.2	53.8 (39.4-68.3)	1.05 (0.79-1.40)
Occupational class							
No manual	51.7	34.7	10.8	42.9	11.7	54.6 (45.5-63.6)	1
Manual	48.3	34.8	14.0	41.1	10.1	51.2 (44.3-58.0)	0.94 (0.77-1.14)
Seniority (years)							
<1	10.2	44.9	11.4	31.4	12.4	43.7 (27.1-60.3)	1
[1,5)	28.2	25.7	14.7	48.6	11.0	59.6 (48.7-70.5)	1.37 (0.89-2.11)
[5,10)	16.1	35.4	13.3	42.4	8.9	51.3 (37.3-65.4)	1.12 (0.69-1.82)
>= 10	45.5	37.8	10.7	40.3	11.2	51.5 (42.7-60.3)	1.09 (0.70-1.71)
Weekly working hours							
< 20	4.9	28.5	21.3	37.1	13.1	50.2 (32.0-68.4)	1.04 (0.71-1.51)
20-34	14.0	29.8	18.0	37.9	14.3	52.2 (36.8-67.6)	1.04 (0.75-1.44)
35-40	65.6	39.3	10.2	40.0	10.5	50.5 (43.3-57.7)	1
41-48	6.0	29.5	11.8	44.5	14.3	58.7 (37.1-80.4)	1.18 (0.83-1.69)
> 48	9.5	16.6	14.2	63.6	5.5	69.1 (52.5-85.7)	1.41 (1.08-1.83)
Salary structure							
Fixed	79.0	36.4	12.7	42.1	8.8	50.9 (44.1-57.7)	1
Mixed	13.7	30.0	12.0	45.8	12.2	58.0 (43.0-72.9)	1.16 (0.87-1.54)
Variable	7.3	25.0	9.2	34.7	31.1	65.8 (47.7-83.9)	1.33 (0.99-1.79)
Contribution of worker's wage-total household income							
<= 40%	17.3	26.3	17.4	41.9	14.4	56.3 (44.5-68.2)	1
41-60%	35.2	46.0	10.2	32.7	11.2	43.8 (32.3-55.4)	0.77 (0.55-1.09)
61-99%	11.0	36.2	11.2	41.4	11.2	52.6 (37.2-68.1)	0.93 (0.66-1.29)
100%	36.5	27.4	12.4	51.4	8.8	60.3 (52.5-68.0)	1.06 (0.83-1.35)
Employment status							
Permanent	79.9	37.3	10.9	41.5	10.4	51.8(45.1-58.6)	1
Temporary	17.5	26.4	18.3	44.7	10.6	55.3 (42.8-67.9)	1.11 (0.86-1.42)
No contract	2.6	13.2	14.6	43.8	28.3	72.2 (48.5-95.9)	1.51 (1.02-2.23)
Downsizing							
No	74.2	37.5	12.2	41.0	9.3	50.3 (42.7-57.9)	1
Yes	25.8	26.4	13.2	44.4	16.0	60.4 (51.8-69.1)	1.20 (0.97-1.49)
Overall		34.7	12.3	42.1	10.9	53.0 (46.9-59.1)	

STROBE Statement—checklist of items that should be included in reports of observational studies

Section/Topic	Item No	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 prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up	N/A
		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	N/A
		Cross-sectional study—Give the eligibility criteria, and the sources and methods of selection of participants	5
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed	N/A
		Case-control study—For matched studies, give matching criteria and the number of controls per case	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6
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	6
Bias	9	Describe any efforts to address potential sources of bias	5
Study size	10	Explain how the study size was arrived at	5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6

Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6-7
		(*b*) Describe any methods used to examine subgroups and interactions	6
		(*c*) Explain how missing data were addressed	N/A
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed	N/A
		Case-control study—If applicable, explain how matching of cases and controls was addressed	N/A
		Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	7
		(*e*) Describe any sensitivity analyses	N/A
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	N/A
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Tables 1 & 2
		(b) Indicate number of participants with missing data for each variable of interest	N/A
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	N/A
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	N/A
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	N/A
		Cross-sectional study—Report numbers of outcome events or summary measures	6,7 and tables 1-3
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	6,7 and tables 1-3
		(*b*) Report category boundaries when continuous variables were categorized	N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	8-10
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	10-11

Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11
Generalisability	21	Discuss the generalisability (external validity) of the study results	11
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	12

BMJ Open

Prevalence, associated factors and reasons for sickness presenteeism: A nationally representative study of salaried workers in Spain, 2016

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2017-021212.R1
Article Type:	Research
Date Submitted by the Author:	26-Apr-2018
Complete List of Authors:	Navarro, Albert; Autonomous University of Barcelona, Research Group on Psychosocial Risks, Organization of Work and Health (POWAH); Autonomous University of Barcelona, Biostatistics Unit, Faculty of Medicine Salas-Nicás, Sergio; Autonomous University of Barcelona, Research Group on Psychosocial Risks, Organization of Work and Health (POWAH); Autonomous University of Barcelona, Biostatistics Unit, Facuty of Medicine Moncada, Salvador; Union Institute of Work, Environment and Health (ISTAS), Reference Centre on Work Organisation and Health Llorens, Clara; Autonomous University of Barcelona, Research Group on Psychosocial Risks, Organization of Work and Health (POWAH); Union Institute of Work, Environment and Health (ISTAS), Reference Centre on Work Organisation and Health Molinero-Ruiz, Emilia; Public Health Agency of Barcelona, Epidemiology Service
Primary Subject Heading:	Occupational and environmental medicine
Secondary Subject Heading:	Public health, Epidemiology
Keywords:	Sickness presenteeism, Population-based study, Spain

Prevalence, associated factors and reasons for sickness presenteeism: A nationally representative study of salaried workers in Spain, 2016

Albert Navarro[1,2], Sergio Salas-Nicás[1,2], Salvador Moncada[3], Clara Llorens[1,3,4], Emilia Molinero-Ruiz[5]

Affiliation of authors:

[1] Research group on Psychosocial risks, Organization of Work and Health (POWAH). Autonomous University of Barcelona (UAB). Cerdanyola del Vallès, Spain.

[2] Biostatistics Unit. Department of Paediatrics, Obstetrics & Gynaecology, Preventive Medicine and Public Health. Autonomous University of Barcelona (UAB), Cerdanyola del Vallès, Spain.

[3] Union Institute of Work, Environment and Health (ISTAS), Reference Centre on Work Organisation and Health, Barcelona, Spain.

[4] Sociology Department. Faculty of Sociology and Political Sicences. Autonomous University of Barcelona (UAB), Cerdanyola del Vallès, Spain.

[5] Epidemiology Service, Public Health Agency of Barcelona, Spain.

Corresponding author: Albert Navarro. Biostatistics Unit. Faculty of Medicine. Autonomous University of Barcelona (UAB), 08193 Cerdanyola del Vallès, Spain. e-mail: albert.navarro@uab.cat

Keywords: Sickness presenteeism, Population-based study, Spain.

Word count abstract: 255 / **Word count text:** 3181

Abstract

Objectives: The aim of this study was to estimate the prevalence of sickness presenteeism (SP), its associated factors, and the reasons given for SP episodes, among both the overall salaried population and excluding the "healthy" workers.

Design: Population-based cross-sectional study.

Setting: Salaried population in Spain.

Participants: Data was obtained from the third Spanish Psychosocial Risks Survey (2016), carried out between October and December 2016, n=1615.

Main outcome measures: Self-reported episodes of SP and their reasons.

Results: 23.0% (95CI%=19.2-26.8) of the workers exhibit SP, whereas among those manifesting having had some health problem in the preceding year, the figure was 53.0% (95%CI: 46.9-59.1). The factors associated with SP when we study all workers are age, seniority, salary structure, working more than 48 hours, the contribution of worker's wage to the total household income and downsizing; factors among the "unhealthy" workers are working more than 48 hours and not having a contract. The most common reason for SP is "did not want to burden my colleagues", 45.7% (95CI%=37.3-54.4), whereas "I could not afford it for economic reasons" ranked third, 35.9% (29.4-42.9), and 27.5% (21.3-34.6) of the workers report "worried about being laid off" as a reason for going to work despite being ill.

Conclusions: The estimated frequency of SP in Spain is lower than certain other countries, such as the Scandinavian countries. The factors associated vary depending on the population analysed (all workers or excluding "healthy" workers). The reason "I was worried about being laid off" was much more common than the estimates for Sweden or Norway.

Strengths and limitations of this study

- First study presenting simultaneously the different factors associated with SP depending on the population analysed (overall or excluding "healthy" workers)
- The sample size and the representativeness at population level.
- The survey includes an important number of sociodemographic and occupational variables that enable us to stratify to obtain relevant findings.
- Being based on a cross-sectional design, we cannot establish any causal relationship.

Background

The concept of presenteeism has been a topic of interest since the 1980s in the business and social science literature.[1] For these disciplines the concern on presenteeism is mainly related to the economic impact due to the loss of productivity of people who attend work despite being ill or feeling like they should have taken sick leave.[1 2] A second approach, developed especially by European researchers, is focused in the act of atteding work while sick and its effects on worker's health.[2 3] In this approach, sickness presenteeism (SP) commonly replaces the term "presenteeism".

SP is defined as the fact of working despite being ill[4] and it should be considered an important public health issue due to its association with a range of health problems,[5–10] with future episodes of sickness absence;[7 8 11 12] furthermore, it has important implications for employing organizations, and theory in the domain of attendance at work.[13] Reviewing the literature we have observed that the majority of studies estimating "prevalences" of SP, do so on the working population not excluding the "healthy" workers, who by definition can not exhibit SP.

While still relatively scarce, evidence regarding this problem is becoming more common. The vast majority of research on SP has been developed using an equivalent question to that formulated by Aronsson et al:[4] *"Has it happened over the previous 12 months that you have gone to work despite feeling that you really should have taken sick leave due to your state of health?"*. No research based on a similar question has been done in Spain.. In fact, to the best of our knowledge, the quantitative evidence on SP in Spain is limited to one study published

in 2010 that reported certain differences between Spanish-born and immigrant workers[14] and from the European Working Conditions Surveys (EWCS).[3]

Going to work despite being ill can be motivated by several reasons such as job insecurity, high workload, inability to adjust work demands, negative sanctions from colleagues or managers, work culture or work ethic. But it can also be due to "positive" reasons such as thinking that it is beneficial for health or simply because one enjoys his/her job.[15] Regarding this topic, and excepting some papers analysing only health care professionals,[16–20] to the best of our knowledge, the published literature is restricted to two papers in Norway and Sweden (one of them in general working population[15] and the other in long-term sick-listed subjects),[21] another in a Canadian public service organization involved in a multi-year downsizing initiative[22] and a qualitative study conducted in the UK.[23]

The aim of this study was to estimate the prevalence of SP, determine the factors associated with it, and to identify the reasons given for SP episodes, among both the entire salaried population and excluding the “healthy” workers.

Methods

Study population and design

Population-based cross-sectional study. Data was obtained from the third edition of the Spanish Psychosocial Risks Survey (ERP2016 in its Spanish acronym), carried out between October and December 2016, and which is based on a representative sample of the salaried population in Spain obtained through a four-stage stratified design: the stratification is based

on geographical area and size of municipality; the stages correspond to municipality, census tract, household and salaried worker. The ERP2016 is a representative survey of wage earners whose main aims are to characterize the salaried workers of the Spanish labour market in terms of the psychosocial risk dimensions defined in the COPSOQ method,[24] and to obtain the Spanish normative values of COPSOQ . The questionnaire was administered using CAPI (Computer Assisted Personal Interviewing) in the respondent's home, participation being voluntary and confidential, participants having given prior consent. The response rate was 70.1%. The specific sample for this study corresponds to n=1615 workers who had undertaken paid work for at least one hour during the week prior to their interview, and who had worked for at least nine months during the last year. This sample represents an overall population of 13 543 087 salaried workers. The data were analyzed anonymously and all procedures were approved by the Ethics Committee on Animal and Human Experimentation of the Autonomous University of Barcelona (CEEAH/3445).

Patient and public involvement

Participation was voluntary and confidential. It was proposed to the workers to be involved in the establishment of a cohort study. For this, his informed consent was requested.

Sickness presenteeism

Self-reported SP was measured using the question (Q1): *"In the last 12 months, how many times have you worked even though you thought you should have taken sick-leave due to your state of health?",* the answer being the total number of times. If the answer to the previous question was "zero", the worker was then asked (Q2): *"You have said none. Was this because you were never sick, or because you took sick leave whenever you were sick?".*

For purposes of comparability the answer was subsequently categorised as proposed by Aronsson[25] into: 1) "no, never" (Q1=0 and Q2="I took sick leave when I was sick); 2) "yes, once" (Q1=1); 3) "2-5 times" ($2 \leq Q1 \leq 5$); 4) "more than 5 times" ($Q1 > 5$); 5) "I have not been sick during the past 12 months" (Q1=0 and Q2="I was never sick). The prevalence of SP was estimated using the usual criterion[4] which considers that a worker exhibits SP if he/she went to work twice or more during the preceding year even though "sick".

Reasons for SP

Each worker who had one or more episodes of SP answered the question *"Why did you go to work even if you thought that you should have taken a sick leave?"* with ten non-exclusive options. The list of possible reasons was elaborated by the authors based on the paper published by Johansen et al.[15]

Covariates

Each worker was characterized sociodemographically (sex, age and country of birth), and based on his/her ocupational class, aspects of the job (seniority, employment status, working hours, salary structure, downsizing) and the importance of his/her wage in relation to the household income.

Statistical analysis

Frequency distributions of SP were elaborated for the whole population and stratified by covariate, and the SP prevalences (overall and for each group according to the covariate categories) were estimated through their 95%CI.

To identify the factors possibly associated with SP the corresponding prevalence ratios (aPR) were estimated, adjusted for sex, age and occupational class, by fitting robust Poisson

models. All results are presented: a) in relation to all workers; b) considering only the "unhealthy" workers (those classified as 1, 2, 3 or 4 according to the Aronsson's SP categories –see the previous subsection "Sickness presenteeism"-).

To determine the frequency of the reasons for SP, the percentage and its 95%CI were estimated for each reason.

Sampling weights were calculated to account for the probability of a worker being selected according to the sampling design and to comply with the sex and occupational class distribution of the Spanish salaried population. All analyses were conducted using the 'svy' command of the STATA statistical package, version 11.0 (Stata Corp., College Station, TX, USA).

Results

Figure 1 shows the distribution of the workers according to their "health" status and SP. The first percentages are the estimations on the total workers, whereas the values in parentheses correspond to the percentages exclusively among the "unhealthy" workers (those with sick leave (SL) and/or SP episodes). We can observe that 71.7% of the total workers do not report SP episodes (56.6% because they did not manifest having felt, at any time in the past 12 months, that they should have stayed home for health reasons and consequently they can not present any SP episode; and 15.1% because did take SL when "sick"), 5.3% present 1 SP episode, 18.3% present between 2 and 5, and 4.7% more than 5 episodes. If we limit our attention to the "unhealthy" workers, 34.7% do not report any SP episode and 12.3%, 42.1% and 10.9% report 1, 2-5, or more than 5 SP episodes, respectively.

Table 1 presents the results related with the prevalences and associated factors when we consider all the workers studied. The overall prevalence of SP, based on the usual criterion of "two or more episodes" is 23.0% (95CI%: 19.2-26.8). The prevalence is clearly lower among workers aged 16 to 24 years, 9.8% (95%CI: 4.3-15.4), than among the rest; workers who have been in their job for less than one year have a lower prevalence, 14.0% (95%CI: 8.0-19.9), especially in comparison to those who have been in the job for 1-5 years (aPR=1.84; 95%CI: 1.16-2.93); among those working more than 48 hours/week the prevalence reaches 35.6% (95%CI: 20.6-50.5), i.e. 1.62 times higher than those who work between 35 and 40 hours; compared to workers with a fixed salary, the prevalence also rises among workers whose salary is partly fixed, partly variable (aPR=1.57; 95%CI: 1.05-2.34) or entirely variable (aPR=1.93; 95%CI: 1.30-2.88); workers whose salary is the only source of household income have a higher prevalence, 29,4% (95%CI: 23.4-35.4); finally, workers in firms which performed downsizing in the last year have higher prevalence (aPR=1.55; 95%CI: 1.15-2.10).

Table 2 presents results only for workers who manifested having felt, at some time in the past 12 months, that they should have stayed home for health reasons. The prevalence of SP (two or more episodes) rises to 53.0% (95%CI: 46.9-59.1), and the majority of differences between groups observed in Table 1 become moderate or disappear. Receiving an entirely variable salary almost reachesstatistical relevance (aPR=1.33; 95%CI: 0.99-1.79). The only statistically remarkable findings show a higher prevalence among workers without a contract (aPR=1.51; 95%CI: 1.02-2.23) and among those working more than 48 hours weekly (aPR=1.41; 95%CI: 1.08-1.83). In fact, employment status and weekly working hours are associated (data not shown), so that almost half of those who do not have a contract are

concentrated in the two extreme categories of weekly hours, less than 20 hours (21.8%) and more than 48 (25.1%), while 2.4% are in the category 35-40 hours. In contrast, among the permanent workers 70.5% lie in the category 35-40 hours, 3.9% work less than 20 hours and 9.5% more than 48.

Nearly 10% of the workers with SP episodes do not choose any reason among the ten that were proposed, and 32.9% four or more, the average number of reasons being 2.9±2.9. Table 3 shows the frequencies of the reasons for SP. Almost half of the workers that have experienced SP report "did not want to burden my colleagues", making it the most frequent reason, 45.7% (95%CI: 37.3-54.4). Economic motives rank third, 35.9% (95%CI: 29.4-42.9), above the concern to be laid off, 27.5% (21.3-34.6), while 11.8% (7.6-17.8) of the workers with SP episodes went to work because they thought it was beneficial to their health.

Discussion

This study allows for first time to obtain the estimated prevalences of SP in Spain using a similar question to that formulated by Aronsson,[4] which is widely used in research on SP. Furthermore, to the best our knowledge, this paper is the first that shows the different factors associated with SP depending on the population analysed (overall or excluding "healthy" workers). Quantifying the frequency of SP and its associated factors has practical implications because it can help in the planning of possible interventions aiming to reduce its occurrence. This is important because SP has a direct effect on worker's health[10] but it is also related with future long-term sickness absence[11 12] that can represent more severe health problems and an increase of costs for employee, employer, and society.[12]

The frequency of SP estimated when we analyse the entire wage-earning population is lower than that obtained in studies conducted in Scandinavian countries, using an equivalent question and the same criteria for definition of SP. Thus, studies conducted in Sweden[7 25] and Denmark[26] show that the percentage of workers with two or more SP episodes exceeds 50%, whereas in our study this figure was less than half. One must be cautious however, given that the points in time do not coincide, and in some cases the degree of representativeness of samples in which estimates are made is not clear. One must also be aware of the difficulty of comparing studies between countries, since the influence which different systems of social protection (unemployment, exercise of workers' rights, etc.) may have on episodes of SP must be taken into account, as well as cultural aspects related with the perception of being incapable of working, or related with work ethics differing between countries.

In addition to applying the approach most widely used in the literature which estimates the proportion of workers with SP out of the total number of workers, we have opted to complement the results reporting findings only for workers who manifested having health problems during the preceding year. If we accept "Going to work despite judging that one should have reported in sick",[4] or any equivalent expression as the definition of SP, it is clear that to be "at risk of being presenteeist" the necessary previous condition is having been "sick", and hence it seems that the denominator over which to estimate the prevalence of presenteeism should be the latter, rather than the total number of workers. Of the few authors taking this approach, d'Errico,[3] using EWCS data, situates Spain slightly below the EU27 average, and above other mediterranean countries such as Italy or Greece, and clearly below UK and the Scandinavian countries.

Depending on the approach used, we observe differences in terms of both magnitudes and associated factors. Thus, taking all workers into account, it would appear that the phenomenon under study is strongly associated with variables such as age or seniority, and others as the salary structure, working more than 48 hours, contribution of worker's salary to the household income and downsizing. When we exclude "healthy" workers, the association of these factors disappears or their strength is moderated. We hypothesize that this phenomenon is due to the fact that the effect of these factors is more important on the worker's health status than on the decision about whether to take sick leave or not. In our opinion, age and seniority are two clear examples of this fact. Both variables are closely related to the health status, age directly and seniority indirectly through age; but instead it is foreseeable that older workers (with greater seniority) commonly have consolidated rights that should allow them to take sick leave if necessary. On the other hand, among the "unhealthy" workers not having a work-contract emerges as the factor most strongly associated, which was not significantly associated when we took all workers into account. It is worth mentioning that Agudelo-Suárez[14] found this association in Spain, exclusively for foreign-born workers living in Spain for two or more years. If SP can be in the most part seen as the impossibility of exercising the right of taking sick leave, then not having a contract means not having the legal right. The second significant factor was working more than 48 hours. This association was previously found in a Finnish study;[27] in Denmark a similar result was found, in this case for the factor "working more than 45 hours".[26] In both studies it was also seen that this factor is positively associated with SP and negatively with absenteeism, suggesting that these groups choose to go to work ill rather than taking sick leave, despite having the same levels of morbidity as other groups.[26] Working more than 48 hours could be an indicator of long working hours or overtime, in any case could be related to having a demanding job in terms of amount of work so accumulation of work or burdening colleagues

could be reasons in a country where the crisis has considerably reduced staffing levels. It is also worth mentioning that we identified an association between employment status and weekly working hours. It probably denotes that not having a contract and working more than 48 hours share part of the effect on SP.

The most common reason for SP was "did not want to burden my colleagues", as in other studies conducted in Norway and Sweden[15 21] and along the same line as a Canadian study.[22] It seems that in Spain the "negative" reasons for SP are more frequent than in the Scandinavian countries, whereas the "positive" reasons are less frequent: we found more than one out of four workers expressing being worried about being laid off, considerably higher than that estimated in Sweden, 4%, or Norway, 3%. However, the reason "Because I enjoyed my work" was less common than in those countries (30% and 44% in Sweden and Norway, respectively).[15] This could be due to several factors, possibly very different between Spain and the Scandinavian countries, such as labour management practices or structural variables (unemployment rate, for example). On the other hand, the fact that nearly 10% of the workers with SP episodes in our study did not select any reason might indicate that the list of motives is not fully comprehensive. This could be related to the fact that the reasons why SP occurs can be very diverse and promoted both from the personal and institutional context.[23] Future research should be conducted on this topic, using open-labelled answers or qualitative approaches to find unknown reasons.

This study has some limitations. Being based on a cross-sectional design, we cannot establish any causal relationship and the associations that we found should be tested in longitudinal studies. On the other hand, like any study based on a self-reported outcomes we can not exclude the existence of some biases in the worker's answers. Some studies have shown that

employees tend to under-report their sickness absence,[28] but there are no studies addressing under-reporting of SP. We also do not know if there is a bias in the reasons given for SP: it could happen that some of the reasons are socially more acceptable than others and consequently workers tend to choose them. The fact that the interview was carried out anonymously in the worker's home should lessen this bias, if it really exists. On the other hand, the good response rate, the sample size and the representativeness at population level are notable strengths of our study.

In our opinion, studying SP in relation to the totality of workers, or restricting to those reporting health problems, represents the study of two different phenomena. The first approach describes a phenomenon which is a mixture of health status and exercising of rights (where perhaps the former has more weight); the second approach focuses specifically on the exercise of the right to take sick leave, especially when the episodes are not generated by "positive" reasons.

Finally, our study seems to indicate that the prevalence of SP in Spain could be remarkably less than other European countries but, at the same time, the reasons that motivate the SP episodes seem to be more often negative, which could lead to more serious consequences. Any research on SP should include not only the estimation of its frequency but also the reported reasons. Two populations with the same prevalence but a remarkably different distribution of reasons could capture distinct phenomena and, consequently, different preventive measures should be applied.

Authors' Contributions

AN was responsible for analysing the data and for drafting the first version of the manuscript. SSN performed the bibliographic search. AN, SSN, SM, CL and EMR were involved in the data collection, study design, interpretation of data and critical review of the manuscript.

Competing Interests

The authors declare that they have no competing interests.

Ethics approval

The data were analysed anonymously and all procedures were approved by the Ethics Committee on Animal and Human Experimentation of the Autonomous University of Barcelona (CEEAH/3445).

Funding

This study was financially supported by two grants of the Instituto de Salud Carlos III, Spanish Ministry of Economy, Industry and Competitiveness [PI15/00161 and PI15/00858]

Data Sharing

No additional data are available.

References

1. Widera E, Chang A, Chen HL. Presenteeism: a public health hazard. *J Gen Intern Med* 2010;**25**:1244–7.
2. Johns G. Presenteeism in the workplace: A review and research agenda. *J Organ Behav* 2010;**31**:519–42.
3. d'Errico A, Leombruni R. Work Organization , Exposure to Workplace Hazards and Sickness Presenteeism in the European Employed Population. *Am J Ind Med* 2016;**59**:57–72.
4. Aronsson G, Gustafsson K, Dallner M. Sick but yet at work. An empirical study of sickness presenteeism. *J Epidemiol Community Heal* 2000;**54**:502–9.
5. Bergström G, Bodin L, Hagberg J, et al. Does sickness presenteeism have an impact on future general health? *Int Arch Occup Environ Health* 2009;**82**:1179–90.
6. Aronsson G, Gustafsson K, Mellner C. Sickness presence, sickness absence, and self-reported health and symptoms. *Int J Work Heal Manag* 2011;**4**:228–43.
7. Gustafsson K, Marklund S. Consequences of sickness presence and sickness absence on health and work ability: a Swedish prospective cohort study. *Int J Occup Med Environ Health* 2011;**24**:153–65.
8. Taloyan M, Aronsson G, Leineweber C, et al. Sickness presenteeism predicts suboptimal self-rated health and sickness absence: a nationally representative study of the Swedish working population. *PLoS One* 2012;**7**:e44721.
9. Conway PM, Hogh A, Rugulies R, et al. Is sickness presenteeism a risk factor for depression? A Danish 2-year follow-up study. *J Occup Environ Med* 2014;**56**:595–603.
10. Skagen K, Collins AM. The consequences of sickness presenteeism on health and wellbeing over time: A systematic review. *Soc Sci Med* 2016;**161**:169–77.

11. Hansen CD, Andersen JH. Sick at work--a risk factor for long-term sickness absence at a later date? *J Epidemiol Community Health* 2009;**63**:397–402.

12. Bergström G, Bodin L, Hagberg J, et al. Sickness presenteeism today, sickness absenteeism tomorrow? A prospective study on sickness presenteeism and future sickness absenteeism. *J Occup Environ Med* 2009;**51**:629–38.

13. Johns G. Attendance dynamics at work: The antecedents and correlates of presenteeism, absenteeism, and productivity loss. *J Occup Health Psychol* 2011;**16**:483–500.

14. Agudelo-Suárez AA, Benavides FG, Felt E, et al. Sickness presenteeism in Spanish-born and immigrant workers in Spain. *BMC Public Health* 2010;**10**:791.

15. Johansen V, Aronsson G, Marklund S. Positive and negative reasons for sickness presenteeism in Norway and Sweden: a cross-sectional survey. *BMJ Open* 2014;**4**:e004123.

16. Tan PC, Robinson G, Jayathissa S, et al. Coming to work sick: a survey of hospital doctors in New Zealand. *J New Zeal Med Assoc* 2014;**127**:23–35.

17. Krane L, Larsen EL, Nielsen CV, et al. Attitudes towards sickness absence and sickness presenteeism in health and care sectors in Norway and Denmark: a qualitative study. *BMC Public Health* 2014;**14**:880.

18. Gustafsson Senden M, Schenck-Gustafsson K, Fridner A. Gender differences in Reasons for Sickness Presenteeism - a study among GPs in a Swedish health care organization. *Ann Occup Environ Med* 2016;**28**:50.

19. Rebmann T, Turner JA, Kunerth AK. Presenteeism Attitudes and Behavior Among Missouri Kindergarten to Twelfth Grade (K–12) School Nurses. *J Sch Nurs* 2016;**32**:407–15.

20. Kim J, Suh EE, Ju S, et al. Sickness Experiences of Korean Registered Nurses at

Work: A Qualitative Study on Presenteeism. *Asian Nurs Res (Korean Soc Nurs Sci)* 2016;**10**:32–8.

21. Marklund S, Aronsson G, Johansen V, et al. Previous sickness presence among long-term sick-listed in Norway and Sweden: A retrospective study of prevalence and self-reported reasons. *Int J Soc Welf* 2015;**24**:376–87.

22. Caverley N, Cunningham JB, MacGregor JN. Sickness Presenteeism, Sickness Absenteeism, and Health Following Restructuring in a Public Service Organization. *J Manag Stud* 2007;**44**:304–19.

23. Baker-McClearn D, Greasley K, Dale J, et al. Absence management and presenteeism: The pressures on employees to attend work and the impact of attendance on performance. *Hum Resour Manag J* 2010;**20**:311–28.

24. Moncada S, Utzet M, Molinero E, et al. The copenhagen psychosocial questionnaire II (COPSOQ II) in Spain--a tool for psychosocial risk assessment at the workplace. *Am J Ind Med* 2014;**57**:97–107.

25. Aronsson G, Gustafsson K. Sickness presenteeism: prevalence, attendance-pressure factors, and an outline of a model for research. *J Occup Environ Med* 2005;**47**:958–66.

26. Hansen CD, Andersen JH. Going ill to work--what personal circumstances, attitudes and work-related factors are associated with sickness presenteeism? *Soc Sci Med* 2008;**67**:956–64.

27. Böckerman P, Laukkanen E, Bockerman P, et al. What makes you work while you are sick? Evidence from a survey of workers. *Eur J Public Health* 2010;**20**:43–6.

28. van Poppel MNM, de Vet HCW, Koes BW, et al. Measuring sick leave: a comparison of self-reported data on sick leave and data from company records. *Occup Med (Lond)* 2002;**52**:485–90.

Figure 1. Distribution of workers according to "health" status and SP episodes.

Table 1. Distribution of covariates, episodes, prevalences of presenteeism and prevalence ratios adjusted by sex, age and occupational class (aPR). All workers.

	Weigthed distribution, %	SP episodes distribution, %				Prevalence (95%CI), %	aPR (95%CI)
		0	1	2-5	>5		
Sex							
Male	51.9	74.4	4.0	17.9	3.7	21.6 (16.5-26.7)	1
Female	48.1	68.7	6.8	18.7	5.8	24.4 (19.3-29.5)	1.09 (0.81-1.47)
Age							
16-24	8.9	80.3	9.9	9.1	0.7	9.8 (4.3-15.4)	1
25-34	19.8	74.3	5.3	16.4	4.1	20.4 (14.1-26.7)	2.02 (1.07-3.79)
35-44	28.5	69.7	3.3	22.5	4.5	27.0 (19.3-34.7)	2.62 (1.39-4.92)
45-54	29.3	68.6	5.2	18.7	7.6	26.3 (19.2-33.3)	2.55 (1.43-4.55)
> 54	13.6	73.0	7.2	17.1	2.7	19.8 (11.6-27.9)	1.93 (0.94-3.95)
Country of birth							
Spanish or OECD	88.4	71.2	5.4	18.9	4.5	23.4 (19.3-27.5)	1
Non-OECD	11.6	75.5	4.4	13.7	6.4	20.0 (12.7-27.4)	0.95 (0.64-1.40)
Occupational class							
No manual	47.1	68.9	5.1	20.5	5.6	26.0 (20.1-31.9)	1
Manual	52.9	74.2	5.5	16.3	4.0	20.2 (16.3-24.2)	0.79 (0.61-1.04)
Seniority (years)							
<1	13.8	82.4	3.6	10.0	4.0	14.0 (8.0-19.9)	1
[1,5)	27.2	66.6	6.6	21.8	5.0	26.8 (20.1-33.5)	1.84 (1.16-2.93)
[5,10)	16.1	72.0	5.8	18.4	3.9	22.2 (14.1-30.3)	1.47 (0.85-2.56)
>= 10	42.8	71.3	4.9	18.6	5.1	23.7 (18.4-29.1)	1.45 (0.88-2.40)
Weekly working hours							
< 20	6.5	76.4	7.0	12.2	4.3	16.6 (7.7-25.4)	0.75 (0.44-1.26)
20-34	15.6	72.6	7.0	14.8	5.6	20.4 (12.2-28.5)	0.86 (0.56-1.32)
35-40	61.4	71.9	4.7	18.6	4.9	23.4 (18.8-28.0)	1
41-48	8.6	78.7	3.6	13.4	4.3	17.7 (6.6-28.8)	0.80 (0.42-1.51)
> 48	8.0	57.1	7.3	32.7	2.8	35.6 (20.6-50.5)	1.62 (1.04-2.54)
Salary structure							
Fixed	83.8	74.0	5.2	17.2	3.6	20.8 (16.8-24.8)	1
Mixed	10.7	61.1	6.7	25.4	6.8	32.2 (20.8-43.7)	1.57 (1.05-2.34)
Variable	5.5	56.7	5.3	20.0	18.0	38.0 (22.5-53.5)	1.93 (1.30-2.88)
Contribution of worker's wage-total household income							
<= 40%	21.4	74.1	6.1	14.7	5.1	19.8 (13.6-26.0)	1
41-60%	34.3	75.9	4.5	14.6	5.0	19.5 (13.9-25.2)	0.99 (0.65-1.50)
61-99%	11.9	74.5	4.5	16.6	4.5	21.1 (11.7-30.4)	1.11 (0.67-1.85)
100%	32.4	64.6	6.0	25.1	4.3	29.4 (23.4-35.4)	1.53 (1.05-2.23)
Employment status							
Permanent	76.2	71.5	5.0	18.9	4.7	23.6 (19.4-27.7)	1
Temporary	20.1	72.3	6.9	16.8	4.0	20.8 (14.3-27.4)	0.95 (0.68-1.33)
No contract	3.7	73.2	4.5	13.6	8.8	22.3 (6.7-38.0)	1.03 (0.50-2.13)
Downsizing							
No	78.8	74.3	5.0	16.9	3.8	20.7 (16.3-25.0)	1
Yes	21.2	60.7	7.0	23.7	8.5	32.2 (25.5-39.0)	1.55 (1.15-2.10)
Overall		71.7	5.3	18.3	4.7	23.0 (19.2-26.8)	

Table 2. Distribution of covariates, episodes, prevalences of presenteeism and prevalence ratios adjusted by sex, age and occupational class (aPR). Excluding workers who have not been sick during the past 12 months.

	Weigthed	SP episodes distribution, %				Prevalence	
	distribution, %	0	1	2-5	>5	(95%CI), %	aPR (95% CI)
Sex							
Male	49.2	37.8	9.6	43.5	9.1	52.6 (43.6-61.5)	1
Female	50.8	31.7	14.9	40.7	12.6	53.4 (45.4-61.3)	1.01 (0.80-1.26)
Age							
16-24	4.9	17.1	41.6	38.3	3.1	41.4 (21.1-61.6)	1
25-34	20.2	42.0	11.9	37.0	9.2	46.1 (31.8-60.4)	1.11 (0.63-1.95)
35-44	29.8	33.2	7.3	49.7	9.8	59.5 (49.2-69.8)	1.42 (0.83-2.43)
45-54	32.7	35.2	10.6	38.6	15.6	54.2 (42.7-65.6)	1.30 (0.78-2.15)
> 54	12.5	32.0	18.2	43.0	6.9	49.8 (36.8-62.8)	1.20 (0.68-2.13)
Country of birth							
Spanish or OECD	90.0	34.8	12.3	42.8	10.2	53.0 (46.4-59.5)	1
Non-OECD	10.0	34.5	11.7	36.6	17.2	53.8 (39.4-68.3)	1.05 (0.79-1.40)
Occupational class							
No manual	51.7	34.7	10.8	42.9	11.7	54.6 (45.5-63.6)	1
Manual	48.3	34.8	14.0	41.1	10.1	51.2 (44.3-58.0)	0.94 (0.77-1.14)
Seniority (years)							
<1	10.2	44.9	11.4	31.4	12.4	43.7 (27.1-60.3)	1
[1,5)	28.2	25.7	14.7	48.6	11.0	59.6 (48.7-70.5)	1.37 (0.89-2.11)
[5,10)	16.1	35.4	13.3	42.4	8.9	51.3 (37.3-65.4)	1.12 (0.69-1.82)
>= 10	45.5	37.8	10.7	40.3	11.2	51.5 (42.7-60.3)	1.09 (0.70-1.71)
Weekly working hours							
< 20	4.9	28.5	21.3	37.1	13.1	50.2 (32.0-68.4)	1.04 (0.71-1.51)
20-34	14.0	29.8	18.0	37.9	14.3	52.2 (36.8-67.6)	1.04 (0.75-1.44)
35-40	65.6	39.3	10.2	40.0	10.5	50.5 (43.3-57.7)	1
41-48	6.0	29.5	11.8	44.5	14.3	58.7 (37.1-80.4)	1.18 (0.83-1.69)
> 48	9.5	16.6	14.2	63.6	5.5	69.1 (52.5-85.7)	1.41 (1.08-1.83)
Salary structure							
Fixed	79.0	36.4	12.7	42.1	8.8	50.9 (44.1-57.7)	1
Mixed	13.7	30.0	12.0	45.8	12.2	58.0 (43.0-72.9)	1.16 (0.87-1.54)
Variable	7.3	25.0	9.2	34.7	31.1	65.8 (47.7-83.9)	1.33 (0.99-1.79)
Contribution of worker's wage-total household income							
<= 40%	17.3	26.3	17.4	41.9	14.4	56.3 (44.5-68.2)	1
41-60%	35.2	46.0	10.2	32.7	11.2	43.8 (32.3-55.4)	0.77 (0.55-1.09)
61-99%	11.0	36.2	11.2	41.4	11.2	52.6 (37.2-68.1)	0.93 (0.66-1.29)
100%	36.5	27.4	12.4	51.4	8.8	60.3 (52.5-68.0)	1.06 (0.83-1.35)
Employment status							
Permanent	79.9	37.3	10.9	41.5	10.4	51.8(45.1-58.6)	1
Temporary	17.5	26.4	18.3	44.7	10.6	55.3 (42.8-67.9)	1.11 (0.86-1.42)
No contract	2.6	13.2	14.6	43.8	28.3	72.2 (48.5-95.9)	1.51 (1.02-2.23)
Downsizing							
No	74.2	37.5	12.2	41.0	9.3	50.3 (42.7-57.9)	1
Yes	25.8	26.4	13.2	44.4	16.0	60.4 (51.8-69.1)	1.20 (0.97-1.49)
Overall		34.7	12.3	42.1	10.9	53.0 (46.9-59.1)	

Table 3. Reasons given for SP.

Why did you go to work even if you thought that you should have taken a sick leave?	Percentage (95%CI), %
Because I did not want to burden my colleagues	45.7 (37.3-54.4)
Because I would have accumulated the job	38.5 (31.5-45.9)
Because I could not afford it for economic reasons	35.9 (29.4-42.9)
Because no one else could do my job	35.5 (29.8-41.7)
Because I did not want to be considered lazy or unproductive	31.6 (24.7-39.4)
Because I was worried about being laid off	27.5 (21.3-34.6)
Because I was worried about being subjected to some other kind of retaliation	26.3 (20.0-33.7)
Because I enjoyed my work	21.4 (15.4-29.0)
Because I did not want to be considered weak	20.0 (15.1-26.1)
Because going to work was beneficial for my health	11.8 (7.6-17.8)

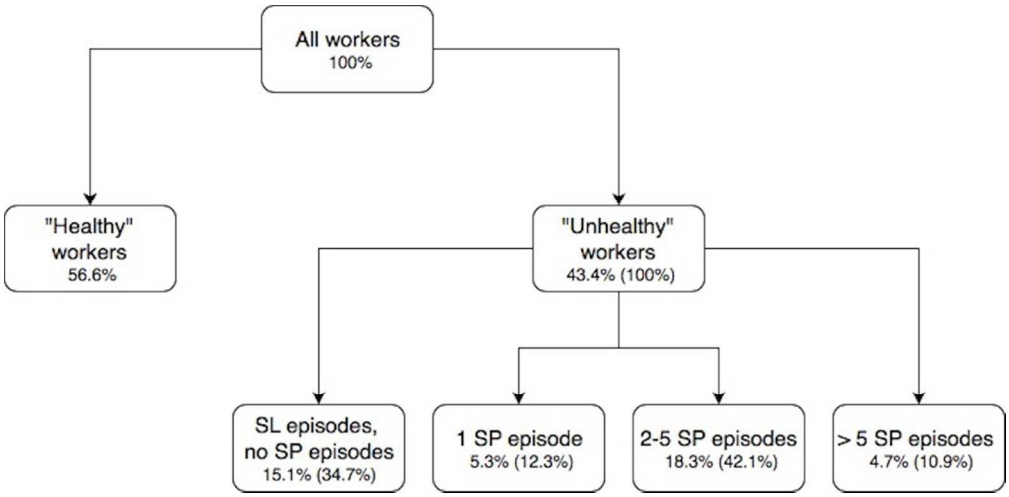

Figure 1. Distribution of workers according to "health" status and SP episodes.

90x43mm (300 x 300 DPI)

STROBE Statement—checklist of items that should be included in reports of observational studies

Section/Topic	Item No	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 prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
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	N/A
		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	N/A
		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	N/A
		Case-control study—For matched studies, give matching criteria and the number of controls per case	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
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	6-7
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7

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
		(*c*) Explain how missing data were addressed	N/A
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed	N/A
		Case-control study—If applicable, explain how matching of cases and controls was addressed	N/A
		Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	5-6,8
		(*e*) Describe any sensitivity analyses	N/A
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	N/A
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Tables 2 & 3, Figure 1
		(b) Indicate number of participants with missing data for each variable of interest	N/A
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	N/A
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	N/A
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	N/A
		Cross-sectional study—Report numbers of outcome events or summary measures	8-10, tables 1-3 and figure 1
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	8-10, tables 1-3 and figure 1
		(*b*) Report category boundaries when continuous variables were categorized	N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	10-14

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	13-14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	10-11
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	15

BMJ Open

Prevalence, associated factors and reasons for sickness presenteeism: A cross-sectional nationally representative study of salaried workers in Spain, 2016

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2017-021212.R2
Article Type:	Research
Date Submitted by the Author:	08-Jun-2018
Complete List of Authors:	Navarro, Albert; Autonomous University of Barcelona, Research Group on Psychosocial Risks, Organization of Work and Health (POWAH); Autonomous University of Barcelona, Biostatistics Unit, Faculty of Medicine Salas-Nicás, Sergio; Autonomous University of Barcelona, Research Group on Psychosocial Risks, Organization of Work and Health (POWAH); Autonomous University of Barcelona, Biostatistics Unit, Facuty of Medicine Moncada, Salvador; Union Institute of Work, Environment and Health (ISTAS), Reference Centre on Work Organisation and Health Llorens, Clara; Autonomous University of Barcelona, Research Group on Psychosocial Risks, Organization of Work and Health (POWAH); Union Institute of Work, Environment and Health (ISTAS), Reference Centre on Work Organisation and Health Molinero-Ruiz, Emilia; Public Health Agency of Barcelona, Epidemiology Service
Primary Subject Heading:	Occupational and environmental medicine
Secondary Subject Heading:	Public health, Epidemiology
Keywords:	Sickness presenteeism, Population-based study, Spain

Prevalence, associated factors and reasons for sickness presenteeism: A cross-sectional nationally representative study of salaried workers in Spain, 2016

Albert Navarro[1,2], Sergio Salas-Nicás[1,2], Salvador Moncada[3], Clara Llorens[1,3,4], Emilia Molinero-Ruiz[5]

Affiliation of authors:

[1] Research group on Psychosocial risks, Organization of Work and Health (POWAH). Autonomous University of Barcelona (UAB). Cerdanyola del Vallès, Spain.

[2] Biostatistics Unit. Department of Paediatrics, Obstetrics & Gynaecology, Preventive Medicine and Public Health. Autonomous University of Barcelona (UAB), Cerdanyola del Vallès, Spain.

[3] Union Institute of Work, Environment and Health (ISTAS), Reference Centre on Work Organisation and Health, Barcelona, Spain.

[4] Sociology Department. Faculty of Sociology and Political Sciences. Autonomous University of Barcelona (UAB), Cerdanyola del Vallès, Spain.

[5] Epidemiology Service, Public Health Agency of Barcelona, Spain.

Corresponding author: Albert Navarro. Biostatistics Unit. Faculty of Medicine. Autonomous University of Barcelona (UAB), 08193 Cerdanyola del Vallès, Spain. e-mail: albert.navarro@uab.cat

Keywords: Sickness presenteeism, Population-based study, Spain.

Word count abstract: 255 / **Word count text:** 3255

Abstract

Objectives: The aim of this study was to estimate the prevalence of sickness presenteeism (SP), its associated factors, and the reasons given for SP episodes, among both the overall salaried population and excluding the "healthy" workers.

Design: Population-based cross-sectional study.

Setting: Salaried population in Spain.

Participants: Data was obtained from the third Spanish Psychosocial Risks Survey (2016), carried out between October and December 2016, n=1615.

Main outcome measures: Self-reported episodes of SP and their reasons.

Results: 23.0% (95CI%=19.2-26.8) of the workers exhibit SP, whereas among those manifesting having had some health problem in the preceding year, the figure was 53.0% (95%CI: 46.9-59.1). The factors associated with SP when we study all workers are age, seniority, salary structure, working more than 48 hours, the contribution of worker's wage to the total household income and downsizing; factors among the "unhealthy" workers are working more than 48 hours and not having a contract. The most common reason for SP is "did not want to burden my colleagues", 45.7% (95CI%=37.3-54.4), whereas "I could not afford it for economic reasons" ranked third, 35.9% (29.4-42.9), and 27.5% (21.3-34.6) of the workers report "worried about being laid off" as a reason for going to work despite being ill.

Conclusions: The estimated frequency of SP in Spain is lower than certain other countries, such as the Scandinavian countries. The factors associated vary depending on the population analysed (all workers or excluding "healthy" workers). The reason "I was worried about being laid off" was much more common than the estimates for Sweden or Norway.

Strengths and limitations of this study

- First study presenting simultaneously the different factors associated with SP depending on the population analysed (overall or excluding "healthy" workers)
- The sample size and the representativeness at population level.
- The survey includes an important number of sociodemographic and occupational variables that enable us to stratify to obtain relevant findings.
- Being based on a cross-sectional design, we cannot establish any causal relationship.

Background

The concept of presenteeism has been a topic of interest since the 1980s in the business and social science literature.[1] For these disciplines the concern on presenteeism is mainly related to the economic impact due to the loss of productivity of people who attend work despite being ill or feeling like they should have taken sick leave.[1 2] A second approach, developed especially by European researchers, is focused in the act of attending work while sick and its effects on worker's health.[2 3] In this approach, sickness presenteeism (SP) commonly replaces the term "presenteeism".

SP is defined as the fact of working despite being ill[4] and it should be considered an important public health issue due to its association with a range of health problems,[5–10] with future episodes of sickness absence;[7 8 11 12] furthermore, it has important implications for employing organizations, and theory in the domain of attendance at work.[13] Reviewing the literature we have observed that the majority of studies estimating "prevalences" of SP, do so on the working population not excluding the "healthy" workers, who by definition are not at risk for SP.[4–6 8 11 12 14–18]

While still relatively scarce, evidence regarding this problem is becoming more common. The vast majority of research on SP has been developed using an equivalent question to that formulated by Aronsson et al:[4] *"Has it happened over the previous 12 months that you have gone to work despite feeling that you really should have taken sick leave due to your state of health?"*. No research based on a similar question has been done in Spain. In fact, to the best of our knowledge, the quantitative evidence on SP in Spain is limited to one study published

in 2010 that reported certain differences between Spanish-born and immigrant workers[19] and from the European Working Conditions Surveys (EWCS).[3]

Going to work despite being ill can be motivated by several reasons such as job insecurity, high workload, inability to adjust work demands, negative sanctions from colleagues or managers, work culture or work ethic.[2 20] But it can also be due to "positive" reasons such as thinking that it is beneficial for health or simply because one enjoys his/her job.[21] Regarding this topic, and excepting some papers analysing only health care professionals,[16 22–25] to the best of our knowledge, the published literature is restricted to two papers in Norway and Sweden (one of them in general working population[21] and the other in long-term sick-listed subjects),[15] another in a Canadian public service organization involved in a multi-year downsizing initiative[26] and a qualitative study conducted in the UK.[27]

The aim of this study was to estimate the prevalence of SP, determine the factors associated with it, and to identify the reasons given for SP episodes, among both the entire salaried population and excluding the “healthy” workers.

Methods

Study population and design

Population-based cross-sectional study. Data was obtained from the third edition of the Spanish Psychosocial Risks Survey (ERP2016 in its Spanish acronym),[28] carried out between October and December 2016, and which is based on a representative sample of the salaried population in Spain obtained through a four-stage stratified design: the stratification is based

on geographical area and size of municipality; the stages correspond to municipality, census tract, household and salaried worker. The ERP2016 is a representative survey of wage earners whose main aims are to characterize the salaried workers of the Spanish labour market in terms of the psychosocial risk dimensions defined in the COPSOQ method,[29] and to obtain the Spanish normative values of COPSOQ . The questionnaire was administered using CAPI (Computer Assisted Personal Interviewing) in the respondent's home, participation being voluntary and confidential, participants having given prior consent. The response rate was 70.1%. The specific sample for this study corresponds to n=1615 workers who had worked for at least nine months during the last year, and who had undertaken paid work for at least one hour during the week prior to their interview (the latter being an International Labour Organization criterion[30] used to define the target population in the European Working Conditions Survey[31] or the EU Labour Force Survey[32]). This sample represents an overall population of 13 543 087 salaried workers. The data were analysed anonymously and all procedures were approved by the Ethics Committee on Animal and Human Experimentation of the Autonomous University of Barcelona (CEEAH/3445).

Patient and public involvement

Participation was voluntary and confidential. It was proposed to the workers to be involved in the establishment of a cohort study. For this, his informed consent was requested.

Sickness presenteeism

Self-reported SP was measured using the question (Q1): *"In the last 12 months, how many times have you worked even though you thought you should have taken sick-leave due to your state of health?",* the answer being the total number of times. If the answer to the previous question was "zero", the worker was then asked (Q2): *"You have said none. Was this because you were never sick, or because you took sick leave whenever you were sick?".*

For purposes of comparability the answer was subsequently categorised as proposed by Aronsson[17] into: 1) "no, never" (Q1=0 and Q2="I took sick leave when I was sick); 2) "yes, once" (Q1=1); 3) "2-5 times" ($2 \leq Q1 \leq 5$); 4) "more than 5 times" ($Q1 > 5$); 5) "I have not been sick during the past 12 months" (Q1=0 and Q2="I was never sick). The prevalence of SP was estimated using the usual criterion[4] which considers that a worker exhibits SP if he/she went to work twice or more during the preceding year even though "sick".

Reasons for SP

Each worker who had one or more episodes of SP answered the question *"Why did you go to work even if you thought that you should have taken a sick leave?"* with ten non-exclusive options. The list of possible reasons was elaborated by the authors based on the paper published by Johansen et al.[21]

Covariates

Each worker was characterized sociodemographically (sex, age and country of birth), and based on his/her occupational class, aspects of the job (seniority, employment status, working hours, salary structure, downsizing) and the importance of his/her wage in relation to the household income.

Statistical analysis

Frequency distributions of SP were elaborated for the whole population and stratified by covariate, and the SP prevalences (overall and for each group according to the covariate categories) were estimated through their 95%CI.

To identify the factors possibly associated with SP the corresponding prevalence ratios (aPR) were estimated, adjusted for sex, age and occupational class, by fitting robust Poisson models. All results are presented: a) in relation to all workers; b) considering only the "unhealthy" workers (those classified as 1, 2, 3 or 4 according to the Aronsson's SP categories –see the previous subsection "Sickness presenteeism"-).

To determine the frequency of the reasons for SP, the percentage and its 95%CI were estimated for each reason.

Sampling weights were calculated to account for the probability of a worker being selected according to the sampling design and to comply with the sex and occupational class distribution of the Spanish salaried population. All analyses were conducted using the 'svy' command of the STATA statistical package, version 11.0 (Stata Corp., College Station, TX, USA).

Results

Figure 1 shows the distribution of the workers according to their "health" status and SP. The first percentages are the estimations on the total workers, whereas the values in parentheses correspond to the percentages exclusively among the "unhealthy" workers (those with sick leave (SL) and/or SP episodes). We can observe that 71.7% of the total workers do not report SP episodes (56.6% because they did not manifest having felt, at any time in the past 12 months, that they should have stayed home for health reasons and consequently they can not present any SP episode; and 15.1% because did take SL when "sick"), 5.3% present 1 SP episode, 18.3% present between 2 and 5, and 4.7% more than 5 episodes. If we limit our

attention to the "unhealthy" workers, 34.7% do not report any SP episode and 12.3%, 42.1% and 10.9% report 1, 2-5, or more than 5 SP episodes, respectively.

Table 1 presents the results related with the prevalences and associated factors when we consider all the workers studied. The overall prevalence of SP, based on the usual criterion of "two or more episodes" is 23.0% (95CI%: 19.2-26.8). The prevalence is clearly lower among workers aged 16 to 24 years, 9.8% (95%CI: 4.3-15.4), than among the rest; workers who have been in their job for less than one year have a lower prevalence, 14.0% (95%CI: 8.0-19.9), especially in comparison to those who have been in the job for 1-5 years (aPR=1.84; 95%CI: 1.16-2.93); among those working more than 48 hours/week the prevalence reaches 35.6% (95%CI: 20.6-50.5), i.e. 1.62 times higher than those who work between 35 and 40 hours; compared to workers with a fixed salary, the prevalence also rises among workers whose salary is partly fixed, partly variable (aPR=1.57; 95%CI: 1.05-2.34) or entirely variable (aPR=1.93; 95%CI: 1.30-2.88); workers whose salary is the only source of household income have a higher prevalence, 29,4% (95%CI: 23.4-35.4); finally, workers in firms which performed downsizing in the last year have higher prevalence (aPR=1.55; 95%CI: 1.15-2.10).

Table 2 presents results only for workers who manifested having felt, at some time in the past 12 months, that they should have stayed home for health reasons. The prevalence of SP (two or more episodes) rises to 53.0% (95%CI: 46.9-59.1), and the majority of differences between groups observed in Table 1 become moderate or disappear. Receiving an entirely variable salary almost reaches statistical relevance (aPR=1.33; 95%CI: 0.99-1.79). The only statistically remarkable findings show a higher prevalence among workers without a contract (aPR=1.51; 95%CI: 1.02-2.23) and among those working more than 48 hours weekly

(aPR=1.41; 95%CI: 1.08-1.83). In fact, employment status and weekly working hours are associated (data not shown), so that almost half of those who do not have a contract are concentrated in the two extreme categories of weekly hours, less than 20 hours (21.8%) and more than 48 (25.1%), while 2.4% are in the category 35-40 hours. In contrast, among the permanent workers 70.5% lie in the category 35-40 hours, 3.9% work less than 20 hours and 9.5% more than 48.

Nearly 10% of the workers with SP episodes do not choose any reason among the ten that were proposed, and 32.9% four or more, the average number of reasons being 2.9±2.9. Table 3 shows the frequencies of the reasons for SP. Almost half of the workers that have experienced SP report "did not want to burden my colleagues", making it the most frequent reason, 45.7% (95%CI: 37.3-54.4). Economic motives rank third, 35.9% (95%CI: 29.4-42.9), above the concern to be laid off, 27.5% (21.3-34.6), while 11.8% (7.6-17.8) of the workers with SP episodes went to work because they thought it was beneficial to their health.

Discussion

This study allows for first time to obtain the estimated prevalences of SP in Spain using a similar question to that formulated by Aronsson,[4] which is widely used in research on SP. Furthermore, to the best our knowledge, this paper is the first that shows the different factors associated with SP depending on the population analysed (overall or excluding "healthy" workers). Quantifying the frequency of SP and its associated factors has practical implications because it can help in the planning of possible interventions aiming to reduce its occurrence. This is important because SP has a direct effect on worker's health[10] but it is also

related with future long-term sickness absence[11 12] that can represent more severe health problems and an increase of costs for employee, employer, and society.[12]

The frequency of SP estimated when we analyse the entire wage-earning population is lower than that obtained in studies conducted in Scandinavian countries, using an equivalent question and the same criteria for definition of SP. Thus, studies conducted in Sweden[7 17] and Denmark[20] show that the percentage of workers with two or more SP episodes exceeds 50%, whereas in our study this figure was less than half. One must be cautious however, given that the points in time do not coincide, and in some cases the degree of representativeness of samples in which estimates are made is not clear. One must also be aware of the difficulty of comparing studies between countries, since the influence which different systems of social protection (unemployment, exercise of workers' rights, etc.) may have on episodes of SP must be taken into account, as well as cultural aspects related with the perception of being incapable of working, or related with work ethics differing between countries.

In addition to applying the approach most widely used in the literature which estimates the proportion of workers with SP out of the total number of workers, we have opted to complement the results reporting findings only for workers who manifested having health problems during the preceding year. If we accept "Going to work despite judging that one should have reported in sick",[4] or any equivalent expression as the definition of SP, it is clear that to be "at risk of being presenteeist" the necessary previous condition is having been "sick", and hence it seems that the denominator over which to estimate the prevalence of presenteeism should be the latter, rather than the total number of workers. Of the few authors taking this approach, d'Errico,[3] using EWCS data, situates Spain slightly below the EU27

average, and above other Mediterranean countries such as Italy or Greece, and clearly below UK and the Scandinavian countries.

Depending on the approach used, we observe differences in terms of both magnitudes and associated factors. Thus, taking all workers into account, it would appear that the phenomenon under study is strongly associated with variables such as age or seniority, and others as the salary structure, working more than 48 hours, contribution of worker's salary to the household income and downsizing. When we exclude "healthy" workers, the association of these factors disappears or their strength is moderated. We hypothesize that this phenomenon is due to the fact that the effect of these factors is more important on the worker's health status than on the decision about whether to take sick leave or not. In our opinion, age and seniority are two clear examples of this fact. Both variables are closely related to the health status, age directly and seniority indirectly through age; but instead it is foreseeable that older workers (with greater seniority) commonly have consolidated rights that should allow them to take sick leave if necessary. On the other hand, among the "unhealthy" workers not having a work-contract emerges as the factor most strongly associated, which was not significantly associated when we took all workers into account. It is worth mentioning that Agudelo-Suárez[19] found this association in Spain, exclusively for foreign-born workers living in Spain for two or more years. If SP can be in the most part seen as the impossibility of exercising the right of taking sick leave, then not having a contract means not having the legal right. The second significant factor was working more than 48 hours. This association was previously found in a Finnish study;[18] in Denmark a similar result was found, in this case for the factor "working more than 45 hours".[20] In both studies it was also seen that this factor is positively associated with SP and negatively with absenteeism, suggesting that these groups choose to go to work ill rather than taking sick leave, despite

having the same levels of morbidity as other groups.[20] Working more than 48 hours could be an indicator of long working hours or overtime, in any case could be related to having a demanding job (as has been shown by other studies)[33] in terms of amount of work so accumulation of work or burdening colleagues could be reasons in a country where the crisis has considerably reduced staffing levels. It is also worth mentioning that we identified an association between employment status and weekly working hours. It probably denotes that not having a contract and working more than 48 hours share part of the effect on SP.

The most common reason for SP was "did not want to burden my colleagues", as in other studies conducted in Norway and Sweden[15 21] and along the same line as a Canadian study.[26] It seems that in Spain the "negative" reasons for SP are more frequent than in the Scandinavian countries, whereas the "positive" reasons are less frequent: we found more than one out of four workers expressing being worried about being laid off, considerably higher than that estimated in Sweden, 4%, or Norway, 3%. However, the reason "Because I enjoyed my work" was less common than in those countries (30% and 44% in Sweden and Norway, respectively).[21] This could be due to several factors, possibly very different between Spain and the Scandinavian countries, such as labour management practices or structural variables (unemployment rate, for example). On the other hand, the fact that nearly 10% of the workers with SP episodes in our study did not select any reason might indicate that the list of motives is not fully comprehensive. This could be related to the fact that the reasons why SP occurs can be very diverse and promoted both from the personal and institutional context.[27] Future research should be conducted on this topic, using open-labelled answers or qualitative approaches to find unknown reasons.

This study has some limitations. Being based on a cross-sectional design, we cannot establish any causal relationship and the associations that we found should be tested in longitudinal studies. On the other hand, like any study based on a self-reported outcomes we can not exclude the existence of some biases in the worker's answers. Some studies have shown that employees tend to under-report their sickness absence,[34] but there are no studies addressing under-reporting of SP. We also do not know if there is a bias in the reasons given for SP: it could happen that some of the reasons are socially more acceptable than others and consequently workers tend to choose them. The fact that the interview was carried out anonymously in the worker's home should lessen this bias, if it really exists. On the other hand, the good response rate, the sample size and the representativeness at population level are notable strengths of our study.

Researchers should consider that studying SP in relation to the totality of workers, or restricting to those reporting health problems, represents the study of two different phenomena. The first approach is based on a mixture of two subpopulations ("healthy" and "unhealthy" workers) where some people are not really exposed to SP because of their good health status and, consequently, describes a phenomenon which is a mixture of health status and exercising of rights (where perhaps the former has more weight); the second approach focuses specifically on the exercise of the right to take sick leave, especially when the episodes are not generated by "positive" reasons.

Finally, our study seems to indicate that the prevalence of SP in Spain could be remarkably less than other European countries but, at the same time, the reasons that motivate the SP episodes seem to be more often negative, which could lead to more serious consequences. Any research on SP should include not only the estimation of its frequency but also the

reported reasons. Two populations with the same prevalence but a remarkably different distribution of reasons could capture distinct phenomena and, consequently, different preventive measures should be applied.

Authors' Contributions

AN was responsible for analysing the data and for drafting the first version of the manuscript. SSN performed the bibliographic search. AN, SSN, SM, CL and EMR were involved in the data collection, study design, interpretation of data and critical review of the manuscript.

Competing Interests

The authors declare that they have no competing interests.

Ethics approval

The data were analysed anonymously and all procedures were approved by the Ethics Committee on Animal and Human Experimentation of the Autonomous University of Barcelona (CEEAH/3445).

Funding

This study was financially supported by two grants of the Instituto de Salud Carlos III, Spanish Ministry of Economy, Industry and Competitiveness (PI15/00161 and PI15/00858) and co-funded by the European Regional Development Fund (ERDF).

Data Sharing

No additional data are available.

References

1. Widera E, Chang A, Chen HL. Presenteeism: a public health hazard. *J Gen Intern Med* 2010;**25**:1244–7.
2. Johns G. Presenteeism in the workplace: A review and research agenda. *J Organ Behav* 2010;**31**:519–42.
3. d'Errico A, Leombruni R. Work Organization , Exposure to Workplace Hazards and Sickness Presenteeism in the European Employed Population. *Am J Ind Med* 2016;**59**:57–72.
4. Aronsson G, Gustafsson K, Dallner M. Sick but yet at work. An empirical study of sickness presenteeism. *J Epidemiol Community Heal* 2000;**54**:502–9.
5. Bergström G, Bodin L, Hagberg J, et al. Does sickness presenteeism have an impact on future general health? *Int Arch Occup Environ Health* 2009;**82**:1179–90.
6. Aronsson G, Gustafsson K, Mellner C. Sickness presence, sickness absence, and self-reported health and symptoms. *Int J Work Heal Manag* 2011;**4**:228–43.
7. Gustafsson K, Marklund S. Consequences of sickness presence and sickness absence on health and work ability: a Swedish prospective cohort study. *Int J Occup Med Environ Health* 2011;**24**:153–65.
8. Taloyan M, Aronsson G, Leineweber C, et al. Sickness presenteeism predicts suboptimal self-rated health and sickness absence: a nationally representative study of the Swedish working population. *PLoS One* 2012;**7**:e44721.
9. Conway PM, Hogh A, Rugulies R, et al. Is sickness presenteeism a risk factor for depression? A Danish 2-year follow-up study. *J Occup Environ Med* 2014;**56**:595–603.
10. Skagen K, Collins AM. The consequences of sickness presenteeism on health and wellbeing over time: A systematic review. *Soc Sci Med* 2016;**161**:169–77.

11. Hansen CD, Andersen JH. Sick at work--a risk factor for long-term sickness absence at a later date? *J Epidemiol Community Health* 2009;**63**:397–402.

12. Bergström G, Bodin L, Hagberg J, et al. Sickness presenteeism today, sickness absenteeism tomorrow? A prospective study on sickness presenteeism and future sickness absenteeism. *J Occup Environ Med* 2009;**51**:629–38.

13. Johns G. Attendance dynamics at work: The antecedents and correlates of presenteeism, absenteeism, and productivity loss. *J Occup Health Psychol* 2011;**16**:483–500.

14. Gustafsson K, Marklund S. Consequences of sickness presence and sickness absence on health and work ability: a Swedish prospective cohort study. *Int J Occup Med Environ Health* 2011;**24**:153–65.

15. Marklund S, Aronsson G, Johansen V, et al. Previous sickness presence among long-term sick-listed in Norway and Sweden: A retrospective study of prevalence and self-reported reasons. *Int J Soc Welf* 2015;**24**:376–87.

16. Tan PC, Robinson G, Jayathissa S, et al. Coming to work sick: a survey of hospital doctors in New Zealand. *J New Zeal Med Assoc* 2014;**127**:23–35.

17. Aronsson G, Gustafsson K. Sickness presenteeism: prevalence, attendance-pressure factors, and an outline of a model for research. *J Occup Environ Med* 2005;**47**:958–66.

18. Böckerman P, Laukkanen E, Bockerman P, et al. What makes you work while you are sick? Evidence from a survey of workers. *Eur J Public Health* 2010;**20**:43–6.

19. Agudelo-Suárez AA, Benavides FG, Felt E, et al. Sickness presenteeism in Spanish-born and immigrant workers in Spain. *BMC Public Health* 2010;**10**:791.

20. Hansen CD, Andersen JH. Going ill to work--what personal circumstances, attitudes and work-related factors are associated with sickness presenteeism? *Soc Sci Med* 2008;**67**:956–64.

21. Johansen V, Aronsson G, Marklund S. Positive and negative reasons for sickness presenteeism in Norway and Sweden: a cross-sectional survey. *BMJ Open* 2014;**4**:e004123.

22. Krane L, Larsen EL, Nielsen CV, et al. Attitudes towards sickness absence and sickness presenteeism in health and care sectors in Norway and Denmark: a qualitative study. *BMC Public Health* 2014;**14**:880.

23. Gustafsson Senden M, Schenck-Gustafsson K, Fridner A. Gender differences in Reasons for Sickness Presenteeism - a study among GPs in a Swedish health care organization. *Ann Occup Environ Med* 2016;**28**:50.

24. Rebmann T, Turner JA, Kunerth AK. Presenteeism Attitudes and Behavior Among Missouri Kindergarten to Twelfth Grade (K–12) School Nurses. *J Sch Nurs* 2016;**32**:407–15.

25. Kim J, Suh EE, Ju S, et al. Sickness Experiences of Korean Registered Nurses at Work: A Qualitative Study on Presenteeism. *Asian Nurs Res (Korean Soc Nurs Sci)* 2016;**10**:32–8.

26. Caverley N, Cunningham JB, MacGregor JN. Sickness Presenteeism, Sickness Absenteeism, and Health Following Restructuring in a Public Service Organization. *J Manag Stud* 2007;**44**:304–19.

27. Baker-McClearn D, Greasley K, Dale J, et al. Absence management and presenteeism: The pressures on employees to attend work and the impact of attendance on performance. *Hum Resour Manag J* 2010;**20**:311–28.

28. Moncada S. Encuesta de Riesgos Psicosociales 2016: persiste la desigualdad en la exposiciones psicosociales laborales. *porExperiencia* 2018;**78**:10–1.

29. Moncada S, Utzet M, Molinero E, et al. The copenhagen psychosocial questionnaire II (COPSOQ II) in Spain--a tool for psychosocial risk assessment at the workplace. *Am J*

Ind Med 2014;**57**:97–107.

30. International Labour Organization. Employment [Internet]. [cited 2018 Jun 7]. Available from: http://www.ilo.org/global/statistics-and-databases/statistics-overview-and-topics/WCMS_470295/lang--en/index.htm

31. Eurofound. EWCS 2015 – Methodology [Internet]. [cited 2018 Jun 8]. Available from: https://www.eurofound.europa.eu/surveys/european-working-conditions-surveys/sixth-european-working-conditions-survey-2015/ewcs-2015-methodology

32. Eurostat. EU labour force survey - methodology [Internet]. [cited 2018 Jun 8]. Available from: http://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey_-_methodology

33. Miraglia M, Johns G. Going to Work Ill: A Meta-Analysis of the Correlates of Presenteeism and a Dual-Path Model. *J Occup Health Psychol* 2016;**21**:261–83.

34. van Poppel MNM, de Vet HCW, Koes BW, et al. Measuring sick leave: a comparison of self-reported data on sick leave and data from company records. *Occup Med (Lond)* 2002;**52**:485–90.

Figure 1. Distribution of workers according to "health" status and SP episodes.

Table 1. Distribution of covariates, episodes, prevalences of presenteeism and prevalence ratios adjusted by sex, age and occupational class (aPR). All workers.

	Weigthed distribution, %	SP episodes distribution, %				Prevalence (95%CI), %	aPR (95%CI)
		0	1	2-5	>5		
Sex							
Male	51.9	74.4	4.0	17.9	3.7	21.6 (16.5-26.7)	1
Female	48.1	68.7	6.8	18.7	5.8	24.4 (19.3-29.5)	1.09 (0.81-1.47)
Age							
16-24	8.9	80.3	9.9	9.1	0.7	9.8 (4.3-15.4)	1
25-34	19.8	74.3	5.3	16.4	4.1	20.4 (14.1-26.7)	2.02 (1.07-3.79)
35-44	28.5	69.7	3.3	22.5	4.5	27.0 (19.3-34.7)	2.62 (1.39-4.92)
45-54	29.3	68.6	5.2	18.7	7.6	26.3 (19.2-33.3)	2.55 (1.43-4.55)
> 54	13.6	73.0	7.2	17.1	2.7	19.8 (11.6-27.9)	1.93 (0.94-3.95)
Country of birth							
Spanish or OECD	88.4	71.2	5.4	18.9	4.5	23.4 (19.3-27.5)	1
Non-OECD	11.6	75.5	4.4	13.7	6.4	20.0 (12.7-27.4)	0.95 (0.64-1.40)
Occupational class							
No manual	47.1	68.9	5.1	20.5	5.6	26.0 (20.1-31.9)	1
Manual	52.9	74.2	5.5	16.3	4.0	20.2 (16.3-24.2)	0.79 (0.61-1.04)
Seniority (years)							
<1	13.8	82.4	3.6	10.0	4.0	14.0 (8.0-19.9)	1
[1,5)	27.2	66.6	6.6	21.8	5.0	26.8 (20.1-33.5)	1.84 (1.16-2.93)
[5,10)	16.1	72.0	5.8	18.4	3.9	22.2 (14.1-30.3)	1.47 (0.85-2.56)
>= 10	42.8	71.3	4.9	18.6	5.1	23.7 (18.4-29.1)	1.45 (0.88-2.40)
Weekly working hours							
< 20	6.5	76.4	7.0	12.2	4.3	16.6 (7.7-25.4)	0.75 (0.44-1.26)
20-34	15.6	72.6	7.0	14.8	5.6	20.4 (12.2-28.5)	0.86 (0.56-1.32)
35-40	61.4	71.9	4.7	18.6	4.9	23.4 (18.8-28.0)	1
41-48	8.6	78.7	3.6	13.4	4.3	17.7 (6.6-28.8)	0.80 (0.42-1.51)
> 48	8.0	57.1	7.3	32.7	2.8	35.6 (20.6-50.5)	1.62 (1.04-2.54)
Salary structure							
Fixed	83.8	74.0	5.2	17.2	3.6	20.8 (16.8-24.8)	1
Mixed	10.7	61.1	6.7	25.4	6.8	32.2 (20.8-43.7)	1.57 (1.05-2.34)
Variable	5.5	56.7	5.3	20.0	18.0	38.0 (22.5-53.5)	1.93 (1.30-2.88)
Contribution of worker's wage-total household income							
<= 40%	21.4	74.1	6.1	14.7	5.1	19.8 (13.6-26.0)	1
41-60%	34.3	75.9	4.5	14.6	5.0	19.5 (13.9-25.2)	0.99 (0.65-1.50)
61-99%	11.9	74.5	4.5	16.6	4.5	21.1 (11.7-30.4)	1.11 (0.67-1.85)
100%	32.4	64.6	6.0	25.1	4.3	29.4 (23.4-35.4)	1.53 (1.05-2.23)
Employment status							
Permanent	76.2	71.5	5.0	18.9	4.7	23.6 (19.4-27.7)	1
Temporary	20.1	72.3	6.9	16.8	4.0	20.8 (14.3-27.4)	0.95 (0.68-1.33)
No contract	3.7	73.2	4.5	13.6	8.8	22.3 (6.7-38.0)	1.03 (0.50-2.13)
Downsizing							
No	78.8	74.3	5.0	16.9	3.8	20.7 (16.3-25.0)	1
Yes	21.2	60.7	7.0	23.7	8.5	32.2 (25.5-39.0)	1.55 (1.15-2.10)
Overall		71.7	5.3	18.3	4.7	23.0 (19.2-26.8)	

Table 2. Distribution of covariates, episodes, prevalences of presenteeism and prevalence ratios adjusted by sex, age and occupational class (aPR). Excluding workers who have not been sick during the past 12 months.

	Weigthed	SP episodes distribution, %				Prevalence	
	distribution, %	0	1	2-5	>5	(95%CI), %	aPR (95% CI)
Sex							
Male	49.2	37.8	9.6	43.5	9.1	52.6 (43.6-61.5)	1
Female	50.8	31.7	14.9	40.7	12.6	53.4 (45.4-61.3)	1.01 (0.80-1.26)
Age							
16-24	4.9	17.1	41.6	38.3	3.1	41.4 (21.1-61.6)	1
25-34	20.2	42.0	11.9	37.0	9.2	46.1 (31.8-60.4)	1.11 (0.63-1.95)
35-44	29.8	33.2	7.3	49.7	9.8	59.5 (49.2-69.8)	1.42 (0.83-2.43)
45-54	32.7	35.2	10.6	38.6	15.6	54.2 (42.7-65.6)	1.30 (0.78-2.15)
> 54	12.5	32.0	18.2	43.0	6.9	49.8 (36.8-62.8)	1.20 (0.68-2.13)
Country of birth							
Spanish or OECD	90.0	34.8	12.3	42.8	10.2	53.0 (46.4-59.5)	1
Non-OECD	10.0	34.5	11.7	36.6	17.2	53.8 (39.4-68.3)	1.05 (0.79-1.40)
Occupational class							
No manual	51.7	34.7	10.8	42.9	11.7	54.6 (45.5-63.6)	1
Manual	48.3	34.8	14.0	41.1	10.1	51.2 (44.3-58.0)	0.94 (0.77-1.14)
Seniority (years)							
<1	10.2	44.9	11.4	31.4	12.4	43.7 (27.1-60.3)	1
[1,5)	28.2	25.7	14.7	48.6	11.0	59.6 (48.7-70.5)	1.37 (0.89-2.11)
[5,10)	16.1	35.4	13.3	42.4	8.9	51.3 (37.3-65.4)	1.12 (0.69-1.82)
>= 10	45.5	37.8	10.7	40.3	11.2	51.5 (42.7-60.3)	1.09 (0.70-1.71)
Weekly working hours							
< 20	4.9	28.5	21.3	37.1	13.1	50.2 (32.0-68.4)	1.04 (0.71-1.51)
20-34	14.0	29.8	18.0	37.9	14.3	52.2 (36.8-67.6)	1.04 (0.75-1.44)
35-40	65.6	39.3	10.2	40.0	10.5	50.5 (43.3-57.7)	1
41-48	6.0	29.5	11.8	44.5	14.3	58.7 (37.1-80.4)	1.18 (0.83-1.69)
> 48	9.5	16.6	14.2	63.6	5.5	69.1 (52.5-85.7)	1.41 (1.08-1.83)
Salary structure							
Fixed	79.0	36.4	12.7	42.1	8.8	50.9 (44.1-57.7)	1
Mixed	13.7	30.0	12.0	45.8	12.2	58.0 (43.0-72.9)	1.16 (0.87-1.54)
Variable	7.3	25.0	9.2	34.7	31.1	65.8 (47.7-83.9)	1.33 (0.99-1.79)
Contribution of worker's wage-total household income							
<= 40%	17.3	26.3	17.4	41.9	14.4	56.3 (44.5-68.2)	1
41-60%	35.2	46.0	10.2	32.7	11.2	43.8 (32.3-55.4)	0.77 (0.55-1.09)
61-99%	11.0	36.2	11.2	41.4	11.2	52.6 (37.2-68.1)	0.93 (0.66-1.29)
100%	36.5	27.4	12.4	51.4	8.8	60.3 (52.5-68.0)	1.06 (0.83-1.35)
Employment status							
Permanent	79.9	37.3	10.9	41.5	10.4	51.8(45.1-58.6)	1
Temporary	17.5	26.4	18.3	44.7	10.6	55.3 (42.8-67.9)	1.11 (0.86-1.42)
No contract	2.6	13.2	14.6	43.8	28.3	72.2 (48.5-95.9)	1.51 (1.02-2.23)
Downsizing							
No	74.2	37.5	12.2	41.0	9.3	50.3 (42.7-57.9)	1
Yes	25.8	26.4	13.2	44.4	16.0	60.4 (51.8-69.1)	1.20 (0.97-1.49)
Overall		34.7	12.3	42.1	10.9	53.0 (46.9-59.1)	

Table 3. Reasons given for SP.

Why did you go to work even if you thought that you should have taken a sick leave?	Percentage (95%CI), %
Because I did not want to burden my colleagues	45.7 (37.3-54.4)
Because I would have accumulated the job	38.5 (31.5-45.9)
Because I could not afford it for economic reasons	35.9 (29.4-42.9)
Because no one else could do my job	35.5 (29.8-41.7)
Because I did not want to be considered lazy or unproductive	31.6 (24.7-39.4)
Because I was worried about being laid off	27.5 (21.3-34.6)
Because I was worried about being subjected to some other kind of retaliation	26.3 (20.0-33.7)
Because I enjoyed my work	21.4 (15.4-29.0)
Because I did not want to be considered weak	20.0 (15.1-26.1)
Because going to work was beneficial for my health	11.8 (7.6-17.8)

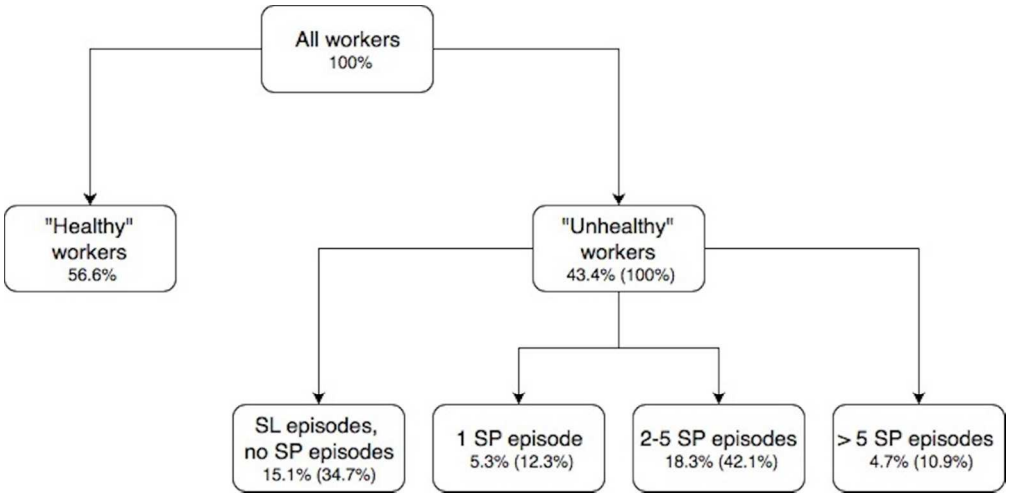

Figure 1. Distribution of workers according to "health" status and SP episodes.

90x43mm (300 x 300 DPI)

STROBE Statement—checklist of items that should be included in reports of observational studies

Section/Topic	Item No	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 prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5
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	N/A
		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	N/A
		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	N/A
		Case-control study—For matched studies, give matching criteria and the number of controls per case	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
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	6-7
Bias	9	Describe any efforts to address potential sources of bias	6
Study size	10	Explain how the study size was arrived at	6
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7

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
		(*c*) Explain how missing data were addressed	N/A
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed	N/A
		Case-control study—If applicable, explain how matching of cases and controls was addressed	N/A
		Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	5-6,8
		(*e*) Describe any sensitivity analyses	N/A
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	N/A
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Tables 2 & 3, Figure 1
		(b) Indicate number of participants with missing data for each variable of interest	N/A
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	N/A
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	N/A
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	N/A
		Cross-sectional study—Report numbers of outcome events or summary measures	8-10, tables 1-3 and figure 1
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	8-10, tables 1-3 and figure 1
		(*b*) Report category boundaries when continuous variables were categorized	N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	10-14

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	13-14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	10-14
Generalisability	21	Discuss the generalisability (external validity) of the study results	10-11
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	15