Work ability assessment of employees on long term sick leave in insurance medicine
Sánchez Mendoza, P.M.
Chapter 2

Factors associated with long-term sick leave in sick-listed employees: a systematic review

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Abstract

Objective: The objective of this systematic review was to investigate which factors are associated with continued sick leave among workers on sick leave for at least 6 weeks.

Methods: A systematic literature search was performed in Medline, EMBASE and PsycINFO, based on combinations of MeSH terms and free text words. Only cohort studies of workers on sick leave for more than 6 weeks at baseline were included. Outcome was measured in terms of factors related to long-term sick leave. The factors were classified first as predisposing, precipitating or perpetuating factors, and then as individual or work-related factors. Methodological quality was assessed for all studies and the strength of the evidence for each factor was assessed using the levels of evidence rating system.

Results: Five cohort studies fulfilled all inclusion criteria and 77 factors were investigated. Of these, 16 different significant factors associated with long-term sick leave were identified and were all classified as predisposing factors. Evidence was found for 14 individual factors and two work-related factors. The level of evidence was found to be insufficient for all factors except older age and history of sick leave, which were found to have weak evidence.

Conclusions: Based on this review, there is weak evidence that older age and history of sickness absence are factors associated with long-term sick leave in sick-listed employees. There is insufficient evidence for an effect of other individual or work-related factors on long-term sick leave. There are no published studies on perpetuating factors related to long-term sick leave.
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Introduction

Sick leave is a considerable public health problem with substantial financial consequences due to workers’ compensation, medical expenses and productivity losses. For the individual worker, long-term sick leave may result in a weakened financial position, social isolation and exclusion from the labour market (1). Another potential negative consequence for the individual on long-term sick leave is the onset of other disorders such as depression (2). Workers on long-term sick leave have a poor prognosis of returning to work and, depending on the social security system, many end up receiving a disability pension (3,4). Numerous studies have explored the relationship between prognostic factors and the onset of short-term sick leave (less than 6 weeks) and in patient groups with defined diseases (5–7). Apart from disease, however, evidence is lacking for factors associated with continuance of sick leave once the worker has already been sick listed for some weeks. Most of the studies assess factors related to specific diseases (5, 8, 9).

We hypothesise that factors can predict long-term sick leave regardless of the disease-specific health problem of the individual worker. Wright (10) has supported this hypothesis by showing that non-medical factors such as delays in waiting for treatment and anxiety about return to work prevent early return to work. Martin et al (11) highlight the fact that in the case of long-term sick leave, there is usually an underlying medical condition, as well as other non-medical factors, which delays the return to work. Long-term sick leave is a complex phenomenon influenced by factors at different structural levels and the decision not to return to work may be the result of a combination of psychosocial, financial, organisational and medical factors (12). Despite the considerable costs of sickness absence, (1) the factors that perpetuate sickness absence have been poorly investigated.

In order to prevent long-term sick leave and subsequent transition to permanent disability (with a pension), it is important that health care professionals recognise the factors that can encourage or sustain long-term sick leave. The ICF (International Classification of Functioning, Disability and Health) (13) refers to health-related domains that describe body functions and structures, activities and participation. These domains can be influenced by work-related factors such as strenuous work and high job demands and by personal factors such as atti-
tudes, beliefs, lifestyle and behaviour, which can play an important role in the maintenance of work disability. Most studies report the effect of structural damage and disease activity on the process of health functioning and consequent sick leave (14-17). Personal factors and environmental factors may also play an important role in the maintenance of sick leave. Early scientific studies on cohorts of healthy workers show the associations between physical and psychosocial factors and sickness absence.

Personal factors and environmental factors may also play an important role in the maintenance of sick leave. Early scientific studies on cohorts of healthy workers show the associations between physical and psychosocial factors and sickness absence (18–22). However, little information is available on factors which, once the worker has been long-term sick listed, perpetuate sick leave. The identification of factors that perpetuate sick leave can aid the (health care) professional in the selection or development of adequate interventions that help to prevent long-term absenteeism. The objective of this systematic review, therefore, is to investigate which factors are associated with continued sick leave among workers on sick leave for at least 6 weeks.

**Methods**

**Identification of studies**
We performed an extensive search of biomedical and psychological databases (Medline, EMBASE, PsycINFO and the Web of Science) from their inception until July 2007. All studies were independently examined by one reviewer (PD) and checked by a second reviewer. We combined search terms for long-term sick leave with search terms for factors in an effort to find all possible relevant articles. When available, subject headings such as MeSH terms in Medline were also added in the search strategy, in addition to free text words. A systematic search was conducted with the following MeSH terms and free text words in titles and abstracts: chronic sickness absence, sick leave (MeSH), absenteeism (MeSH), work disability, disability leave, return to work, perpetuating factors, sustaining factors and reinforcing factors (see appendix A for Medline, EMBASE and PsycINFO searches). Subsequently, the references of selected articles and recently published review articles were screened for additional publications and citation tracking using the
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Science Citation Index was performed on those studies that were selected. Additionally, we performed a hand search of the most relevant journals in this field, such as *Occupational and Environmental Medicine, BMJ, Journal of Occupational and Environmental Medicine, International Journal of Rehabilitation and Journal of Occupational Rehabilitation*, from the last 7.5 years to verify the completeness of the literature search.

**Selection of studies**
All titles and/or abstracts of the identified publications were screened for potential relevance regarding the aim of this review, which is to investigate the association between factors and sick leave/work-related outcomes. The first reviewer (PD) selected individual identified studies on the basis of title and abstract. The first selection was repeated by the second reviewer (JH) in a random sample. Studies were included if they described the relationship between factors measured at baseline and long-term sick leave or return to work.

In this review, sick leave at baseline was defined as sick leave lasting at least 6 weeks. The following specific inclusion criteria were used: (1) the participants had to be employed at baseline and be at least 18 years old; (2) participants had to have been on sick leave for at least 6 weeks at baseline; and (3) the study design had to be a cohort study. The definitive selection of articles was made on the basis of the full text article. Two reviewers (PD and JH) independently selected studies using a standardised list of selection criteria. Subsequently, the references of all selected articles and recently published review articles were screened for additional publications. After selection, the reviewers met to decide on the definitive selection of articles; in the case of disagreement a third reviewer (JS) made the decision.

**Data extraction**
Data were abstracted by one reviewer (PD) and checked by another (JH) using standardised data extraction forms. Factors associated with long-term sick leave were classified in two main categories: (A) individual factors and (B) work-related factors. Secondly, the factors were classified according to Spielman’s 3 Ps (predisposing, precipitating and perpetuating) factor classification, which is a useful model for organising various aetiological factors (23), as follows: (1) predisposing factors: pre-existing factors which increase the individual’s general vulnerability for sick leave; (2) precipitating factors: conditions that evoke sick leave
at a certain moment; (3) perpetuating factors: variables that contribute to the maintenance of sick leave over time.

Quality assessment
Two reviewers (PD, JH) assessed the methodological quality of the included studies on the basis of a standardised set of criteria that were adapted from criteria lists used in systematic reviews of observational studies (24). Any disagreements were resolved in a consensus meeting and with help of a third reviewer (JS) if necessary. The following items were studied: (1) type of study population and description of demographic/clinical characteristics of participants; (2) response rate; (3) information completers versus those lost to follow-up; (4) main outcome measures; (5) description of the instruments to assess risk factors; (6) frequencies of risk factors; and (7) presentation of analyses data. The reviewers rated each criterion (positive, negative or unknown) on the basis of information provided in the article. Each study was assigned a total quality score (maximum 7 points) which was the sum of all positive ratings for the criteria on validity and precision. Based on these seven criteria (see appendix B for further details), the studies were classified as high (5–7 points), medium (3–4 points) or low quality (0–2 points).

Levels of evidence
To synthesise the information obtained from the studies, we used the levels of evidence method based on de Croon et al (9). The rating system was applied to each factor and consisted of four levels of scientific evidence based on the number and the outcome of the studies:

- Strong evidence: three studies available that find an association in the same direction, or four studies or more available, of which more than 66% find a significant association in the same direction and no more than 25% find an opposite association.
- Weak evidence: two studies available that find a significant association in the same direction, or three studies available, of which two find a significant association in the same direction and the third finds no significant association.
- Insufficient evidence: one study available.
- Inconsistent evidence: remaining cases.
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Results

Selection of studies and methodological quality assessment
The electronic search resulted in 2527 citations, of which 433 articles were considered eligible based on title and abstract. A total of 86% studies were excluded as they were not related to long-term sick leave. Other reasons for exclusion were: (1) subjects were not workers; (2) workers were not on sick leave at baseline; (3) workers were on sick leave at baseline but were already unemployed; (4) workers were on sick leave at baseline but for a period of less than 6 weeks; (5) the study design was not a cohort study; and (6) the outcome did not meet the criteria.

Reviewing the full text resulted in the inclusion of five articles that fulfilled all inclusion criteria. In these five studies, 77 factors were studied and 16 statistically significant factors were identified. Of these five studies, four were of high quality and one was of medium quality. According to the 3 Ps classification system of Spielman, the 16 factors identified were classified as predisposing factors for long-term sick leave. Disagreement was related only to item C (appendix B, drop-outs/loss to follow-up). The results of the quality assessment are presented in table 1.
Quality scores

The studies were classified as high (5-7 points), medium (3-4 points) or low quality (0-2 points).

Table 1 Methodological quality scores for included articles

<table>
<thead>
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<tr>
<td>Study population</td>
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<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Follow-up response</td>
<td>+</td>
<td>?</td>
<td>?</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Information completers versus those loss to follow-up</td>
<td>-</td>
<td>?</td>
<td>-</td>
<td>+</td>
<td>-</td>
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<td>Instrument</td>
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<td>+</td>
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<td>+</td>
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<td>Frequencies, risk factors</td>
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<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Analyses</td>
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<td>+</td>
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<td>5</td>
<td>4</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

+ Method description in text meets criterion

? No method description about this criterion is mentioned in the text, so it is not clear if the method meets the criterion

- Method description in text does not meet criterion

Short description of the five included studies

Heijbel et al (25) investigated if long-term sick-listed persons’ own predictions of their future return to work have an impact on their return to work when controlling for other established factors. The authors investigated 15 variables associated with return to work in a cohort
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study of 525 persons on sick leave for more than 90 days and employed in municipalities and county councils in Sweden.

Schroer et al (26) studied the relationship between organisational characteristics and work disability. This prospective cohort study was performed among 455 employees of 45 profit and non-profit organisations in the Netherlands who were on sick leave for at least 6 weeks at baseline.

Gjesdal et al (27) studied the influence of medical aspects in addition to demographic factors in predicting subsequent transition to a disability pension. This prospective cohort study was performed among 3628 employees in Norway who had been sick listed for at least 8 weeks at baseline.

Janssen et al (28) investigated the prospective value of the demand-control-support model as a predictor of return to work 4 months after the onset of the sick leave episode. This prospective cohort study was performed among 795 employees who were sick listed for 6–8 weeks.

Van der Giezen et al (29) investigated the influence of psychosocial aspects of health and work in combination with economic aspects on return to work. The authors investigated prognostic factors of return to work in a prospective cohort study among 328 employees with 3–4 months of sick leave due to low back pain.

Factors associated with long-term sick leave
In Table 2, the 16 significant factors are categorised in two groups: individual factors and work-related factors. Regarding individual factors, two studies showed that older age (25, 27) is related to long term sick leave. One study showed that female sex, history of sickness absence, having a low income, having mental health disorders and needing comprehensive rehabilitation are significantly related to long-term sick leave (27). Having been on sick leave for a period longer than 1 year, reporting more pain and reporting worse functioning are also associated with long-term sick leave (25). Having a subjective evaluation of poor general health status is associated with long-term sick leave (29). The risk of long-term sick leave and subsequent disability status increases strongly with age for both genders, but the risk of receiving a disability pension is significantly higher for women than for men in the age group 40-49 (27). Not-being the family’s main wage
earner is also a significant factor for long-term sick leave (29). The own expectation of non-return to work and feeling not welcome back to work are associated with long-term sick leave (25).

As work-related factors for long-term sick leave, Janssen et al. (28) found that having a lower degree of skill discretion at work is associated with long-term sick leave. Furthermore, employees working in a non-profit company have an increased risk for long-term sick leave (26). Unemployment status in the year preceding inclusion increases the risk for long-term sick leave for women, but not for men (27). Workers with less job satisfaction have also an increased risk for long-term sick leave (29).

**Results of the evidence synthesis**

Synthesis of the evidence concerning the factors reported in the five included articles showed that there is insufficient evidence for fourteen of the factors since we identified only one study for each of these factors. There is weak evidence for the two identified factors older age and history of sickness absence since we identified two studies for each of these two factors.
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Table 2  Factors associated with long-term sick leave

<table>
<thead>
<tr>
<th>Individual factors</th>
<th>Study</th>
<th>OR/RR</th>
<th>(95% CI)</th>
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<tbody>
<tr>
<td>Poor general health (SF36)</td>
<td>Vd Giezen, 2000</td>
<td>OR 1.6</td>
<td>1.3-1.8</td>
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<tr>
<td>Not being the family’s main wage earner</td>
<td>Vd Giezen, 2000</td>
<td>OR 2*</td>
<td>1.3-3.4</td>
</tr>
<tr>
<td>Older age (&gt;50 yrs old)</td>
<td>Gjesdal, 2004</td>
<td>RR: 7.5 (♂)</td>
<td>5.3-10.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RR: 6.1 (♀)</td>
<td>4.6-8.1</td>
</tr>
<tr>
<td>Older age (&gt;55 yrs old)</td>
<td>Heijbel, 2006</td>
<td>OR 2.2*</td>
<td>1.3-3.7</td>
</tr>
<tr>
<td>Low income</td>
<td>Gjesdal, 2004</td>
<td>RR 1.6 (♂)</td>
<td>1-2.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RR 2.6 (♀)</td>
<td>1.4-4.6</td>
</tr>
<tr>
<td>Unemployment status 1-12 months</td>
<td>Gjesdal, 2004</td>
<td>RR 1.3 (♀)</td>
<td>1-1.7</td>
</tr>
<tr>
<td>Mental health disorders</td>
<td>Gjesdal, 2004</td>
<td>RR 1.5 (♂)</td>
<td>1.1-2.1</td>
</tr>
<tr>
<td>History of sickness absence &gt;100 days</td>
<td>Gjesdal, 2004</td>
<td>RR 1.5 (♂)</td>
<td>1.1-2.1</td>
</tr>
<tr>
<td>Duration of sick leave &gt;1 yr</td>
<td>Heijbel, 2006</td>
<td>RR 1.6 (♀)</td>
<td>1.2-2.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR 2.7*</td>
<td>1.8-4.1</td>
</tr>
<tr>
<td>Assessed to be in need of comprehensive rehabilitation</td>
<td>Gjesdal, 2004</td>
<td>RR 4.3 (♂)</td>
<td>3.1-6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RR 2.3 (♀)</td>
<td>1.7-3.2</td>
</tr>
<tr>
<td>Own prediction of non-RTW</td>
<td>Heijbel, 2006</td>
<td>OR 16.0*</td>
<td>6.9-37.3</td>
</tr>
<tr>
<td>Having more pain**</td>
<td>Heijbel, 2006</td>
<td>OR 5.5*</td>
<td>2.7-11.1</td>
</tr>
<tr>
<td>Having worse function**</td>
<td>Heijbel, 2006</td>
<td>OR 2.7*</td>
<td>1.4-5.2</td>
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</table>

<table>
<thead>
<tr>
<th>Work related factors:</th>
<th>Study</th>
<th>OR</th>
<th>(95% CI)</th>
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<tr>
<td>Having less job satisfaction</td>
<td>Vd Giezen, 2000</td>
<td>1.2</td>
<td>1.1-1.3</td>
</tr>
<tr>
<td>Lack of skill discretion</td>
<td>Janssen, 2003</td>
<td>1.4</td>
<td>1.0-1.7</td>
</tr>
<tr>
<td>Non-profit organisation</td>
<td>Schroer, 2005</td>
<td>2.2</td>
<td>1.2-4.2</td>
</tr>
<tr>
<td>Perception of not being welcomed back to work</td>
<td>Heijbel, 2006</td>
<td>1.9</td>
<td>1.2-3</td>
</tr>
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</table>

* Crude (not-adjusted) odds ratios for individual factors associated with long-term sick leave. **compared to persons in the quartile with the least pain/least impairment of function. ♂ men ♀ women
Chapter 2

Discussion

In this review we identified five studies that fulfilled all inclusion criteria. These studies seem to confirm our hypothesis that there are significant predisposing factors which, regardless of the disease specific health problem of the individual worker, are associated with long-term sick leave. In total, 16 significant factors associated with long-term sick leave were identified. Based on the results of this review we conclude that there is limited evidence that two factors, i.e. older age and history of sickness absence, are associated with long-term sick leave.

Methodological considerations

Analysis of the international literature on long-term sick leave shows that the description and the definition of “long-term sick leave” is not standardised. In most of the studies we retrieved during our literature search there was no distinction between short-term sickness absence and long-term sickness absence. Some authors define long-term sick leave as a period of at least 3 days (30-32) while others define it as a period of 6 weeks (33) or even 8 weeks (27,34,35). In this review, long-term sick leave was defined as absenteeism for 6 weeks or more. The decision to consider a period of 6 weeks’ sick leave in this study was based on the Dutch social security legislation. We recognize that employment conditions, social and insurance conditions vary from country to country and may influence outcomes such as disability pension and work disability. In spite of this, we have identified 16 factors that could prolong long-term sick leave.

We have reasons to believe that, once sickness has developed, several maintaining factors can impede recovery. Different types of processes (intrinsic and extrinsic) seem to be involved in the maintenance of sickness and long-term sick leave. The classification of factors into predisposing, precipitating and perpetuating is useful for grouping aetiological factors and can help identification of the different factors/conditions involved in long-term sick leave and selection of the best interventions. We use the 3 Ps classification of Spielman to describe the factors associated with long-term sick leave. This classification has been used for assessing insomnia, but has also shown to be useful in describing other chronic conditions such as chronic fatigue syndrome (36) and chronic upper extremity musculoskeletal complaints (37). All identified factors in this study were predisposing factors. We originally planned to study
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perpetuating factors for long-term sick leave in order to get more insight into the mechanisms involved in the maintenance of sick leave over time. However, no perpetuating factors were found in this review, nor did we find any studies on precipitating factors. Much literature has been published about the socio-economic effects of long-term absenteeism and subsequent disability leave, but at the same time little is known about the factors involved in the maintenance of sick leave once the employee has been sick-listed.

Conclusions and Recommendations
In this review, 16 factors each associated with long-term sick leave were identified. Limited evidence was only found for the factors older age and history of sickness. All 16 factors were classified as predisposing factors for long-term sick leave. Despite an extensive literature search, no perpetuating factors for long-term sick leave could be identified. Knowing what sustains long-term sick leave can aid health care professionals to (1) identify the obstacles for return to work, (2) select adequate interventions to reduce or eliminate these obstacles, and (3) prevent long-term sick leave. For the identification of perpetuating factors more prognostic studies should be designed to generate valid information and a new hypothesis. The ICF (International Classification of Functioning, Disability and Health) (13) could be a valuable tool to frame the complex factors associated with long-term sick leave. Studies focusing specifically on the patient’s ideas regarding their sick leave, including designs that use concept mapping or focus groups, could also be useful to explore relevant factors.

Main messages box
- There is weak evidence that older age and history of sickness absence are associated with long-term sick leave in sick-listed employees.
- There is insufficient evidence that work-related factors are related to long-term sick leave in sick-listed employees as few studies exist.
- Variables that contribute to the maintenance of sick leave over time remain poorly investigated.

Policy implications box
More prognostic research concerning non-medical factors for long-term sick leave is needed so that appropriate interventions can be selected to prevent transition from sick leave to work disability.
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References

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Factors associated with long-term sick leave in sick-listed employees

Appendix A

Search history for PubMed
1. perpetuating factors
2. sustaining factors
3. reinforcing factors
4. sickness absence
5. work disability
6. long-term sickness absence
7. chronic work disability
8. long-term sickness
9. long-term absence
10. chronic sickness absence
11. sick leave
12. absenteeism
13. long-term work disability
14. disability leave
15. return to work
16. 1 or 2 or 3
17. 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14
18. 15 and 16
19. 16 and 17

Search History for EMBASE
1. perpetuating factors.mp.
2. sustaining factors.mp.
3. reinforcing factors.mp.
4. chronic sickness absence.mp.
5. absenteeism.mp.
6. long-term work disability.mp.
7. disability leave.mp.
8. sickness absence.mp.
9. work disability.mp.
10. long-term sickness absence.mp.
11. chronic work disability.mp.
12. long-term sickness.mp.
13. long-term absence.mp.
14. return to work.mp
15. 1 or 2 or 3
16. 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
17. 14 and 15
18. 15 and 16

Search history for PsycINFO:
1. reinforcing factors
2. sustaining factors
3. perpetuating factors
4. sick leave or absenteeism or long-term work disability
5. disability leave or sickness absence or work disability
6. long-term sickness absence or chronic work disability or long-term sickness or long-term absence
7. return to work
8. 1 or 2 or 3
9. 4 or 5 or 6
10. 8 and 9
11. (“Health attitudes” in MJ, MN) or (“Health Behavior” in MJ, MN) or (“Health-Education” in MJ,MN) or (“Psychosocial-Factors” in MJ,MN)
12. (“Diagnosis” in MJ,MN) or (“Etiology-“ in MJ,MN) or (Risk-Factors in MJ,MN)
13. 10 and 11 and 12
14. 7 and 11 and 12
## Appendix B

### Methodological quality list

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<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Score</th>
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<tr>
<td>A</td>
<td>Description of study population: positive if described in what (occupational) setting the participants were recruited (i.e. insurance board, companies, population)</td>
<td>+/-/?</td>
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<tr>
<td>B</td>
<td>Positive if total number of drop-outs/loss to follow up &lt;20% at the last moment of follow up</td>
<td>+/-/?</td>
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<tr>
<td>C</td>
<td>Information (completers) versus loss to follow-up/drop-outs: positive if demographic/clinical information (participants characteristics such as age, sex and other potential factors) was presented for (completers) and those lost to follow up/drop-outs at the main moment of outcome measurement, or no drop-outs/loss to follow up</td>
<td>+/-/?</td>
</tr>
<tr>
<td>D</td>
<td>Description of main outcome measure (sickness absence)</td>
<td>+/-/?</td>
</tr>
<tr>
<td>E</td>
<td>Description of the instruments used to assess the risk factors. Standardised assessment of patient characteristics and potential risk factor(s) including physical/environmental, mental, work-related, psychosocial and individual factors</td>
<td>+/-/?</td>
</tr>
<tr>
<td>F</td>
<td>Frequencies of all risk factors: positive if frequency, percentage or mean, median (interquartile range) and standard deviation/CI are reported for all factors</td>
<td>+/-/?</td>
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<td>G</td>
<td>Analyses: positive if univariate crude estimates are reported. Positive in case hazard ratios, odds ratios, relative risks, or relative risk ratios are presented. Negative if correlations are reported</td>
<td>+/-/?</td>
</tr>
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</table>

+ positive  
- negative  
? not clear