Author’s response to reviews

Title: Important work demands for reducing sickness absence among workers with neck or upper back pain: a prospective cohort study

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Important work demands for reducing sickness absence among workers with neck pain: a prospective cohort study Stefan Oliv, M.sc; Adnan Noor Baloch, M.Sc; Ewa Gustafsson, Phd; Mats Hagberg, Md, Phd; Helena Sandén, Md, Phd BMC Musculoskeletal Disorders

Dear Editor and Reviewers,

Thank you for your valuable comments. We have made alterations and clarifications in the manuscript following your comments. All alterations and clarifications are listed and highlighted below and in the revised manuscript.

Best regards
Stefan Oliv

Reviewer reports:
Markus Josef Ernst (Reviewer 1): Dear authors,

thank you for submitting this large cohort study to BMC MSK.
The manuscript is well written, trying to demonstrate associations between absence from work due to neck pain and other work-related variables.

However, I so far have some doubts whether the conclusion derived from your study are correct, or whether other variables, not measured or not analysed might have led to another conclusion.
1. According to the Global burden of disease study, neck pain has a yearly prevalence of approx. 4-7% in the general population in Sweden, in your study (working population) it must be much larger (approx. 30% in women, and 18% in men). please provide these figures and explain the differences

   - Thank you for your comment. Yes, you are right, there is a large difference in the reported prevalence of neck pain in different populations. To clarify this, we have added the following statement to the background section:
     Prevalence estimates differs across studies, a review found that the annual prevalence of neck pain in workers ranged from 27-48 % (1). Among workers, 11–14% report activity limitation due to neck pain as measured with compensation claims, but it has been suggested that this is a significant underestimation (2). In Sweden approximately 23 % of workers report neck pain during the last three months. Of those reporting neck pain, 63 % were women (3).

2. While LBP is often associated with absence from work, neck pain is more frequently associated with presenteeism, at least in jobs with lower physical demands.

   - Thank you for your comment. Yes, most workers with neck pain has no sickness absence during the year we measured sickness absence. We have not made any comparison with group of workers who report low back pain.

3. Neck pain often occurs together with low back pain (LBP), but low back pain has much a higher prevalence, again according to the GBD study, how many in your cohort must have complained about LBP? This may be a major confounder in your cohort and you should have discussed this at least, or mention it in your limitations. Especially if you look at the questions of your "physical exposure questionnaire", you might see that these questions are not especially typical for neck pain conditions, except from "lifting over shoulder height", but rather are typical questions someone with LBP might answered to.

   - Thank you for your comment. Yes, you are right, symptoms from several regions are common and we do not know how many individuals in this study have symptoms from other regions in combination with their neck pain. This is an interesting subject but somewhat outside the scope of this project. We agree that this is a limitation of this study, to highlight this we have added the following statement to the discussion section, Strengths, limitations and methodological considerations:
     There are some evidence that multisite pain can have a larger impact on sickness absence than single site pain (33). In this study we have only included workers who reported neck pain and we do not know if they also have pain in other body sites.

4. You conclude that sickness absence from work in one year is related to neck pain conditions in the previous year?

   - Thank you for your question. Our conclusion was that exposure to certain work demands (low exposure to several physical work demands and also having high support) can result in lower sickness absence when compared to having high exposure to these work demands.
5. I must admit that I do not quite understand your outcome or dependend variable. I thought it must be sick days, dichotomized in more than 14d vs. less or equal to 14d!!! So how do I have to understand a table 3, where for example the mean n-day for women is 11 (first row)? what does this mean? are these 11 days above a threshold of 14d? please explain!! Anyway, I found your statistical analysis rather cautious, using a Wilcoxon test for such a large cohort study with a sample size of more than 10'000! I'm however fine with that, as I am not a statistician, but I would expect somehow a regression analysis, to see which of your independent variables might explain sickness absence and to what kind of a percentage. You may add many more variables to that kind of regression as the kind of work which is a variable you already have, might be of importance, too.

- Thank you for your comment. In this study we only have access to registered sickness absence data from the Swedish health insurance system. This insurance only covers sickness absence longer than 14 days (shorter sickness absence is handled by the employer). This means that we cannot make any assumptions on sickness absence between 1 and 14 days. In the analysis (Wilcoxon sum rank test) we compare the distribution of sickness absence in the two groups (high exposure/low exposure).

- To clarify the n-days measure we have added the &gt;14 days statement in table 3. We have also written distribution in italics in the heading for tables 3-7 to clarify the measures used.

Minor issues:

6. Background, page 4/L 23ff: "women have more neck pain than men which is partly explained to work exposure". please explain why and what kind of work exposure might lead to more neck pain in women, probably not heavy lifting.

- Thank you for your comment. To clarify this, we have added the following statement to the background section:
in work exposure between men and women in that women more often perform repetitive work and report poor ergonomics to a higher degree then men

7. I would recommend to move the paragraph "study population" to the results section. Within that paragraph the sentence: "Women workers had ...", the order in the brackets should be changed to: (11 and 9 n-days) and again, please explain, as I thought it would be 14 days at least.

- Thank you for your observation. We have moved the Study population section to the Results section as suggested. We have also changed the sentence:
Women workers had a higher mean number of n-days &gt;14 days compared to men workers (11 and 9 n-days, respectively).

8. Results, page 10/L36ff: change the sentence: "A difference was found..." to somehow:
Those with fewer n-days reported...

- Thank you for your comment. We have changed this sentence as suggested to make it easier to read:
Those who reported high exposure to seated work had fewer registered sickness absence n-days (&gt;14 days) compared to the group reporting low exposure to seated work. Also, the group
who reported high control over one’s work had fewer registered sickness absence n-days (≥14 days) compared to the group reporting low control (Tables 4 and 5).

Tomislav Badel, Ph.D. (Reviewer 2): The author has shown quality in general but some better qualifications are needed before a definitive version.

In Keywords: Work ability, WAI, occupation, occupational health - the term occupational medicine/health implies that already.

9. A clarification is needed: in Sweden, can you use the sick leave registry to follow an individual for 30 years and more and discern how often the neck pain recurred, on which level and how was it treated?

- Thank you for your question. No, from the Swedish sickness compensation registry only compensated sickness absence days (sickness absence days ≥14 days) are recorded, not diagnosis or treatment.

10. The methodology does not mention injuries and it is known how common the whiplash neck injuries are these days (not only in traffic but also during recreation and physical confrontations under the influence of alcohol).

- Thank you for your question. In the Work Environment Survey neck pain is only measured with the included question about pain in the neck or upper back after work during the last 3 months. There is no question about the cause of the neck pain. Thus, we cannot determine if the neck pain is caused by factors at work or other factors such as accidents or other types of injuries.

11. The length of sick leave is usually not the best reflection of somatic pathology and the pyschosocial factors can sometimes be predominant!

- Thank you for your comment. This study attempts to investigate the relationship between factors at work and sickness absence among workers with neck pain. We cannot determine if a person with longer sickness absence has more severe neck problem than those with shorter or no sickness absence.

12. Phone surveys can have several biases! The text does not state how many people answered in that way and how many did not answer to repeated calls, this is a bias. Another methodological issue is who was sent the Additional Questionnaire? Explain from how many questions it consisted and how many subjects answered.

- Thank you for your comment. We agree that this could be made clearer in the text. We have added the following statement to the methods section, source population:
The Work Environment Questionnaire sent consisted of 121 questions regarding various aspects of work environment.

- We also made the following statement in the methods section, study population: A total of 29,682 workers were sent the Work Environment Survey questionnaire and 18,786 replied (63% response rate).

13. The results in the tables indicate a possible bias because there are many more conducted phone replies from the so-called 'white collar' workers than from 'blue collar' workers - Table 2.

- Thank you for your comment. The Work Environment Survey uses a representative sample of the Swedish work force and we have not had any opportunity to choose from which occupational group the questions were sent to.

14. The relation between sick leave and neck pain with vibration is not very convincing, particularly the whole body vibration syndrome! The question of vibration and difficulties and/or disease of cervical spine is stressed too much or the questions are misdirected. This should be explained further in discussion.

- Thank you for your comment. We do not discuss the cause of the reported neck pain, only if then neck pain occurs “after work during the last three months”. The questions used in the Work Environment Survey are general questions with regards to the physical and psychosocial work environment and are not especially constructed to this project.

15. It is well known that Sweden has the so-called 'migrant syndrome' for 30 years. It should be noted how many Swedes and how many immigrants were included in the phone survey and the additional questionnaire. The conclusions should be expanded regarding this.

- Thank you for your comment. The workers included in the The Work Environment Survey are Swedish residents and the cohort consists of a representative sample of the Swedish work force. We have no data on how many were born outside of Sweden which makes it difficult to speculate if there could be a difference how workers with neck pain from different countries are affected by work demands with regards to sickness absence.

16. The advantage of this study is its progressiveness so any issues which come up can be resolved in further studies.

- Thank you for your comment. Hopefully we can continue our research on sickness absence and work demands.

17. The suggestion of the reviewer is that the doctors and the EU do not speak about work competence but instead about medical prognosis of early possibilities taking into account the parameters which they used during examinations (general practitioner, specialist of occupational medicine, neurologist, psychiatrist etc.).
Thank you for your comment. This lies outside the scope of our current project but could be addressed in the future.