Reviewer's report

Title: The effect of health promoting resources on work participation in population reporting musculoskeletal pain. A sample from the Nord-Trondelag Health Study, HUNT 3, Norway.

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Reviewer: Julitta Boschman

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Major Compulsory Revisions

The manuscript handles about differences in personal, social and functional resources among individuals with musculoskeletal pain who were sick listed and who were not. The authors conclude that there are statistically significant differences between the sick listed and working individuals regarding: self-rated health, work support, work control, work load and feeling strong. Furthermore, the authors analyzed the relationship between the aforementioned factors and being sick listed or working.

1. Is the question posed by the authors well defined?

The authors do not clearly pose their research questions in the introduction, but they do hypothesize ‘that specific health resources i.e. personal, social and functional resources strengthen individuals’ health which in its turn contributes to work participation.’ Preferably, the authors specify their research objectives. It was in the results section where it became clear to me that the authors 1) test for differences between the work and sick leave group and female and male participants and 2) relate six psychosocial predictors to the outcome (work or sick leave).

2. Are the methods appropriate and well described?

The methods could be better described. In the abstract it appears that some of the data were gathered by means of a questionnaire, and other data by means of an interview. In the methods section the authors should clarify how and at what time points the data have been gathered.

I would like to ask the authors to please clarify the items of the Eysenck Personality Questionnaire (EPQ). In the first paragraph of the ‘Survey measures’ section it appears that the EPQ consists of one item, but in the first paragraph of the ‘Statistical Analysis’ section it appears that there are at least 12 items, six belonging to the EPQ-E and six to the EPQ-N scale.

The authors measured work characteristics by 12 items and report then ‘work support’, ‘work load’ and ‘work control’ on a scale from 1 to 4 (table 1). I would prefer some clarification on how at this total score was arrived, as it is a bit confusing. Now, it seems a mean score of multiple items and not a summed score.
The authors list examples of the questions measuring ‘personal resources’ and ‘functional resources’, but not for social resources. Furthermore, response options are not clear for the question ‘how often do you exercise’. Please use terms consistently throughout the manuscript. For example, in the methods section the construct ‘personal feeling’ is introduced, but in table 1 this is referred to as ‘Feeling strong’.

3. Are the data sound?
It is very difficult to interpret the data. The reader is left with some questions about the data. For example, the authors included all persons with musculoskeletal pain (MSP) ranging from ‘moderate’ to ‘very strong’ and divided this group in a work group and sick listed group. Therefore, I wondered whether there is a difference in the seriousness of MSP between both groups. The seriousness of MSP might be a reasonable explanation why some people belong to the work group and others to the sick listed group. Furthermore, the authors mention in the abstract ‘they demonstrated with epidemiological strengths’ how resources contribute to health and work among individuals with MSP. However, the reader is not provided with that much epidemiological data. For example, no data on possible confounding factors regarding work/sick leave is presented, such as co-morbidity. Therefore, it is possible that the sample ‘individuals with MSP’ is not that homogenous as presumed by the authors.

Furthermore, the authors have not provided any information on the type of occupation of the respondents. The extent to which MSP affect the ability to work might be related to the physical demands of the job. The authors should take this effect into account.

I would appreciate a table in which the respondent’s characteristics and information on the above mentioned potential confounders or sources of bias. For me, Figure 1 was not more informative than a table presenting the data.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
I think the manuscript would improve when the authors report their work according to a checklist, for example the STROBE Statement. They should clarify the choices they’ve made, for example their a priori choice for a gross measure as ‘sick leave’, without making any distinction between sick leave due to MSP or other types of sick leave and long or short periods of sick leave.

5. Are the discussion and conclusions well balanced and adequately supported by the data?
I think the authors should stay closer to their data and their actual findings. In their discussion they jump for example from ‘feeling being strong’ to ‘neuroticism’ and even to ‘courage’. (Quote: It is possible that a feeling of being strong is a result of absence of neuroticism, and gives courage to break the cycle of MSP and muscle weakness.)

To me, based on the data, it seems just as plausible that working instead of being on sick leave might affect feeling strong and the absence of neuroticism. I
would recommend the authors not to guess about possible causal relationships, unless supported by evidence from other scientific publications.

Furthermore, the authors try to link their results to each other, which leads to some odd comments, for example: ‘This result is also capable to explain the difference between groups and feeling of work control. Men had significantly higher levels of work control than females. Lower level of neuroticism, could promote higher level of responsibility at work which in turn increase the working capacity and distract from pain.’

The authors have specified in their methods section ‘work control’ as ‘deciding what and how work should be done’ and not as ‘having responsibility at work’, which are very distinct features of work. I recommend the authors to stay close to their definitions. When the authors wanted to study the correlation between neuroticism and work control for example, they should have formulated other research questions and have done other statistical analyses.

Furthermore, in my opinion the authors do not provide any implications for future research, but their heading suggests they do. I think the authors can make more specific recommendations for researchers and occupational health care professionals.

6. Are limitations of the work clearly stated?

The authors mention the following limitations: 1) restriction of generalisability; 2) the cross sectional study design; 3) recall bias; 4) the gross measure for sick leave. However, I think the reader could be provided with a more comprehensive discussion on these limitations and if and how the results might have been affected by these limitations. Furthermore, the authors could discuss their a priori choice for the gross measure for sick leave.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?

I think the authors can discuss some more of the (recent) literature on this topic to provide the reader with a more comprehensive understanding of the topic at interest. For example, a review of De Vries et al (2011) on factors promoting staying at work in people with chronic nonspecific musculoskeletal pain or a qualitative study by Van der Meer et al (2011) on experiences of employees with rheumatoid arthritis on work participation.

Furthermore, the authors should provide references when referring to other studies or ‘empirical evidence’. A reference is lacking in for example the following comment in their discussion: ‘Females are also more likely to have worrying and catastrophic thoughts than men, which are consistent with empirical evidence. This may explain the gender difference between groups’.

8. Do the title and abstract accurately convey what has been found?

The title of the manuscript is: “The effect of … “ I think the authors should not use the term ‘effect’. Due to the cross-sectional design of the study, it remains unknown whether there is a causal relationship. I suggest the authors use the term ‘The relationship of…’ for example.
In the title the authors give the impression the manuscript handles about ‘work participation’. However, from the methods section it becomes clear that the manuscript is actually about sick leave among employees. Usually, by work participation is meant the individuals that are actively employed or seeking employment and compared to individuals who are unemployed.

Abstract: Please use also ‘methods’ sections in the abstract.

9. Is the writing acceptable?

The manuscript is not very well written. I recommend the authors to have their manuscript checked and corrected by an editing service. Make sure that the use of past and present tense is correct, use the past tense in the methods and results section.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests