Author's response to reviews

Title: Cross-sectional associations between occupational factors and musculoskeletal pain in female teachers, nurses and sonographers

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Detailed Responses to Editor and the reviewers

Editorial request:

Requesting consent statement:
Please state in the Methods section whether written informed consent for participation in the study was obtained from participants or, where participants are children, a parent or guardian.

Response:
OK. The following sentence has been added in the methods (page 4, line 92) “Written informed consent for participation was obtained from all participants, in every part of the study.”

REWIEVER 1

General comments
1.
Abstract – the aim is not clear about the justification of the study, and need to harmonise with the aim in the context (end of background). Quite a lot the resultsand discussion have focused on disorders when not actual aim of study.

Response:
OK. The aims in the abstract has been rephrased and are now in line with the aim in the end of the background (line 19): " This study aims to ascertain the prevalence of musculoskeletal pain in women with varying or different occupational exposures, and to explore the associations between musculoskeletal pain and the occupational and personal factors. Further, a short description of the results concerning musculoskeletal pain in the
different groups has been added in the abstract (line 27): “Neck pain was equally frequent among teachers, assistant nurses and sonographers, and less frequent in anaesthetic and theatre nurses. The sonographers experienced the highest prevalence of shoulder pain, while the assistant nurses were the most affected in the wrists and hands, lower back, and feet.”

2.
Methods – the study design is well structured but in some parts not so easily accessible to the reader. Need for more information about the technical measurements.

Response:
With have added more information in the section Technical measurements of the physical workload, in page 9:
“…with a double-sided adhesive tape” (page 9, line 239).
“All postures during the recordings were calculated in relation to the reference positions, with a sampling frequency of 20 Hz”. (page 9, line 242)
“…were recorded with a sampling rate of 20 Hz. The angular velocity was used as a measure of movements, and the fraction of time with an angular velocity < 1°/s for continuous time periods of at least 0.5 s indicated that the hand was held still (page 9, line 245).
“Ag/AgCl electrodes were used for the recordings of the muscular activity, at a sampling rate of 1024 Hz.” (page 9, line 253)

3.
The study population – not clear why teachers included into the study. Although work tasks are well described, teachers’ work in essence different from clinical work.

Response:
As explained in the introduction, the five professional groups included represent large contrast concerning physical as well as psychosocial risk factors, which make them interesting to study concerning preventable risk factors for musculoskeletal disorders.
As referee 2 stated that “The main contribution is in the variety of tasks among less physically demanding mostly female workers…” we decided to retain the teachers in the study.

4.
Long period of carrying out questionnaire study… are problematic.

Response:
OK. In Methodological consideration, we have discussed a possible limitation of the study; i.e. we inserted a section where the extended period of data collection was discussed (see below). To avoid duplication of the text, some of the
information that previously was in the methods ("…i.e. we began with a surgery department, then a school, then some sonography departments and then another surgery department, and so on") has been moved to the section in the discussion.

The following has been inserted in the discussion (page 15, line 409): “Data was collected during an extended period of time. However, we alternated the dispatch of questionnaires between the occupational groups: we began with a surgery department, then a school, then some sonography departments, and then another surgery department, and so on. Therefore, we do not believe that the results were affected to any significant extent by any changes in society that may have occurred during this time period.

5. …difficult technical measurements are problematic.

Response: See above answer, General comments, point 2

6. Discussion - First paragraph of the study needs to relate more to the aim of the study. You report on results that were not in the aim of the study.

Response:
OK. A sentence has been added in the beginning of the discussion (page 14, line 387): “Neck pain was equally frequent among teachers, assistant nurses and sonographers, while less frequent among anaesthetic and theatre nurses. The sonographers suffered the highest prevalence of shoulder pain, while the assistant nurses were the most affected in the wrists and hands, lower back and feet.”

7. Conclusions. Although the occupational groups are differently affected by risk factors and pain regions the description of particular protective measures remain too general.

Response:
OK. We have added more details to the conclusions, which now reads as follows (page 19, line 521).
“Thus, to prevent pain among teachers, where the physical workload was lower than in the other groups, the focus should be on improving the psychosocial work environment in terms of reduced emotional demands and workload. In contrast, the surgical staff and sonographers may benefit from preventive measures addressing the physical work load, such as lifting and constrained postures, and, in particular, reducing hand force demands among assistant nurses.”

Specific questions
1.
The aim in the abstract differ from the aim postulated in the context. Please define the aim in the both sections (abstract on the page 1 and context page 3) more clearly that it is unequivocal for readers.

Response:
The issue is addressed in General comments, point 1

2 a)
The 5-years period of measurements via questionnare stydy is too long - (2008-2012). Although the authors stress that „the dispatches of questionnaires alternated between the various employee categories…“, not convincing argument. page 4: In order to avoid that the results would be affected by major changes in society, the dispatches of questionnaires alternated between the various employee categories; i.e. we began with a surgery department, then a school, then some sonography departments and then another surgery department, and so on.

Many changes are taking place during 5 years in the society.

Response:
The issue is addressed in General comments, point 4

2 b)
Surprising, why the authors included teachers into the study. Although the authors used teachers as the reference group, the analysis could be better when only the medical occupations have compared.

Response:
The issue is addressed in General comments, point 3.

3.
The figures are not numbered and not titled. There is difficult to get evidence, is the figure 2 figure or table. Reading of the figure 2 is quite complicated.

Response:
OK. Figure 1 is numbered and titled. Figure 2 has been changed to a table and moved to an additional file (Additional table A2).

4 a)
Page 4, line113 the authors argue that „Personal characteristics are given inTable 1.“ The title of the table 1. Self-reported exposures and personal factors. Sure, the most of information give exposures, and then there are also personal factors. It is better, when these factors are described first in this table. And the sentence, that „Personal characteristics are given together with exposure factors in the Table 1.“
Response:
OK. The order in table 1 is changed according to your recommendation, as well as the sentence “Personal characteristics are given together with exposure factors in the Table 1” (page 5, line 117).

4 b)
The information in the table 6 could be described in the results via text. Five tables enough.
Response:
The information in former table 6 is complicated to describe and explain in text only. Thus, we choose to retain the table (now table 5).

5.
Suggestion. The discussion could be start from the aim of study, is the purpose fulfilled and what kind of difficulties or obstacles remained in formulation of the results.
Response:
OK. We have now started the discussion with the prevalences of pain, followed by variations between the groups in occupational exposures, and associations between pain and physical workload, psychosocial factors and personal factors. In the next section (Methodological considerations), we discuss limitations and strengths of the study.

6 a)
Are limitations of the work clearly stated? No
There are only major strenghts of study are described.
Page 15 line 415…417 „….we defined cases of pain based on the subjects’ reports on frequency as well as intensity 416 of complaints during the preceding 12 months. Such an approach has not, to our 417 knowledge, been used earlier, and we consider this a major strength of the study.
Response:
We do not agree with the reviewer that only strengths are discussed (see point 1 and 2 below).
1) “As in all studies based on self-reported exposure and self-reported health, the results must be interpreted with caution. It is well known that individuals with continuing pain perceive their exposure (physical and psychosocial) to be more demanding than individuals without pain, and they therefore may have overestimated their exposure [26].” (page 14, line 403)
2) The problem that technical measurements were not included in the
multivariable models, was discussed. (page 15, lines 415-429)

As described above in General comments, point 4, the possible limitation resulting from the extended period of data collection has been added to the discussion (page 15, line 409).

6 b)
At the same time in table 3 to 5 it is not clear during which time the pain was measured (past 12 months or last week). No description the results,

Response:
OK. The phrase “during the preceding 12 months” has been added in the table heads for table 2, 3 and 4, and in the legend to figure 1.

REPORT TEMPLATE
Recommendations
Major changes advised: to make new statistical analysis without the teachers’ group;
Response:
The issue is addressed in General comments, point 3.

Moderate essential revisions
1.
To harmonise the aim in abstract and context.
Response:
The issue is addressed in General comments, point 1.

2.
To describe the results of the table 6 in the text;
Response:
The issue is addressed in Specific questions, point 4 a).

3.
To change the order of data in table 1, moving personal data on the first place and then physical work load and psychosocial factors, it’s better to follow them.
Response:
The issue is addressed in Specific questions, point 4 b).

4.
Tables 3, 4, 5 - to add in which time (in past 12 months or last week) the pain was measured. The assessment time is needed to mention in the results and
titles of the tables.
Response: The issue is addressed in Specific questions, point 6 b).

5. To add titles to the figures (Fig 2 or table?). The figure 2 need better description.
Response: The issue is addressed in Specific questions, point 3.

6. Language corrections are advised.
Response: OK. A language-correction has been performed

REWIEVER 2
Discretionary edits: Because the clinical exam and the instrument data of physical demands was not used in the analysis, I found these explanations distracting and therefore the detail may be better summarized in appendix or with more brevity to make the point that the physical requirements of the job did vary in the selection of these jobs (at least for the sampling period).
Also, I found no benefit in the chart of measurements in Figure 2 at the end.
Response: Since the data on clinical examinations are important for comparisons with the reference-data, we choose to retain the clinical examinations in the methods, results and in table 2.
The table 2 and figure 2 describing the technical data have been submitted as additional files (additional tables A1 and A2). At the same time Figure 2 has been changed to a table (Additional table A2)
Minor edits. A number of typos are recommended;
1. Abstract - This study aims to explore which factors ARE association
Response: OK. The sentence in abstract has been extended and rephrased (due to comments from reviewer 1).
2.
Line 169—I am confused by the mention of “8 items” under psychological work environment, followed just after with the note of 8,8, and 9 items for job demands, job control, and support. This appears to be more than “8 items”?

Response:
OK. We agree. “Eight items” has been removed.

3.
Line 276 - pain free individuals ON average

Response:
OK – it has been changed
Major edits - The authors don’t mention the percentage of full-time versus part time workers (50%) in the sample. In the analysis, these groups are treated the same even though the relative exposures between these groups may be as much as double.
A sensitivity analysis of full time workers only would allay the concern that teachers, for example, are more likely to be full time and that bias may be introduced in both the reporting of work exposures and in the chance of adverse outcomes (i.e. the type of neck pain).

Response:
The percentage of individuals who work less than 30 hours per week is low (about 10%) and similar in all groups. Thus, we have not performed any sensitivity analyses. However, we have added information about the number of part-time workers into table 1.

Removed from the manuscript to additional files: Table 2 (now additional table A1) and figure 2 (now additional table A2).