Author's response to reviews

Title: Physical activity is associated with a low prevalence of musculoskeletal disorders in the Royal Norwegian Navy: a cross sectional study

Authors:

Tone Morken (tone.morken@isf.uib.no)
Nils Mageroy (nils.mageroy@isf.uib.no)
Bente E Moen (bente.moen@isf.uib.no)

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Author's response to reviews: see over
Dear EDITOR,

Thank you for the new comments regarding our article. Based on the comments from the reviewers, we have now revised our manuscript.

On the next pages you will find a point-by-point description of the changes made. In the letter we refer to the revised manuscript.

With kind regards

Tone Morken

All correspondence should be addressed to:

Tone Morken
University of Bergen,
National Centre for Emergency Primary Health Care
Department of Public Health and Primary Health Care
Kalfarveien 31
N-5063 Bergen
NORWAY

tone.morken@isf.uib.no
Reviewer 1 (Jan Hartvigsen):
Thank you very much for your comments.

Major Compulsory Revisions

I. As recommended, the sentence starting at the very bottom of page 12 (However,) and the subsequent sentence (However,) are deleted (i.e. the two last sentences before Methodological considerations).

II. Selection bias is further discussed under methodological considerations (page 12), and we have included the suggested paper to the reference list (Hartvigsen et al. 2001):

We are faced with selection bias at two levels. Firstly, the employees in the army are likely to differ from other workers due to health certificate requirements (the healthy worker effect). The healthy worker effect has been shown to significantly influence results of cross-sectional studies dealing with low back pain [44]. Secondly, a selection bias due to the low response of 58% may be present if the non-responders had a different prevalence of MSD and a different degree of physical activity compared with those who responded.
Reviewer 2 (Karin I Proper):
Thank you very much for your comments.

I. We have now included results from separate analyses for heavy physical activity (page 9, 2nd paragraph):

“When the data on light physical activity were excluded from the analysis the odds ratios for the inversed associations between physical activity and MSD were slightly reduced: neck 0.94 (95% CI 0.91, 0.98), shoulders 0.96 (95% CI 0.93, 0.99), hands 0.96 (95% CI 0.91, 1.01), upper back 0.96 (95% CI 0.92, 1.00), lower back 0.97 (95% CI 0.94, 1.00) and hips 0.93 (95% CI 0.89, 0.98).”

We also have included explanation of the analysis in Statistical methods (page 7, 2nd paragraph):

The logistic regression analysis was repeated excluding the answers to the questions about light physical activity to see whether the estimates of the association between physical activity and MSD changed. This means that only the answers to heavy physical activity were included to calculate the physical scale. To be able to compare the estimates when and when not including light physical activity we kept the scale range from 0 to 18.

II. Discussion of explanation for association between light PA and MSD:

The following sentence in the discussion (1st paragraph):

“Both heavy and light physical activity were inversely associated with MSD.”

is replaced by the following sentence:

“Light activity strengthened the inverse association between physical activity and MSD”.

We also have added the following sentence in the results (page 8, 1st paragraph):

“A total of 92 per cent reported that they had performed some heavy physical activity each week the past year.”

and the following sentence in the discussion (page 10, 2nd paragraph):

“Since the majority of our study population performed heavy physical activity, the impact of light physical activity should be studied in a population performing predominantly light activity.”
Reviewer 3 (Alex Burdorf):
Thank you very much for your comments.

Minor Essential Revisions
I. The term “response rate” is deleted from the manuscript.

Reviewer 4 (Linda A Merlino):
Thank you very much for your comments.

Minor Essential Revisions
I. Abstract results:
The third sentence is replaced by your suggested sentence.

II. Methods - Physical activity – pg 5
We have revised the sentences according to your suggestion.

III. Statistical methods (pg 7)
We have corrected the expression “Pearson χ² test” into “we used χ² tests and tested the linear by linear association between the two variables”.

IV. Statistical methods
The term “risk factors” is changed to “confounders” according to your suggestion.

V. Methodological considerations: Target population.
We have included some information on the target population (page 8):
“Similar to the mean age in the total Navy population, the mean age among the respondents was 38 years…”
and
“Eleven per cent of the respondents were women, and the according number in the total Navy population was 12 per cent.”

And discussion of selection bias at page 12:
“However, the fact that the mean age and the number of women in the sample was quite the same as in the total Navy population, might be an indication that the respondents were representative for the Navy population.”

VI. The source for Table 2 is “all workers” and the source for Figure 1 is “military and civilians”. Due to missing numbers in the variable “military status”, Figure 1 has a lower N (N=2250) than Table 2 (N=2258).

VII. The title of Figure 1 is changed to the following:
“Fig. 1. Musculoskeletal disorders experienced often or very often the past 12 months stratified by occupational status in the Royal Norwegian Navy (n = 2250).”

VIII. Statistical methods, second paragraph, page 7.
The sentence is changed according to your suggestion.