Author's response to reviews

Title: A prospective study of sleep quality and quantity, quality of life, and risk of developing diabetes in a prospective cohort of healthy workers in Japan: the High-risk and Population Strategy for Occupational Health Promotion (HIPOP-OHP) Study

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

Thank you for your e-mail letter dated December 23, 2006. Based on your instructions, we revise revised manuscript. The point-by-point responses to the comments raised by the editor and reviewers were followed by this cover letter. All line numbers mentioned in each response to each comment refer to the small-size numbers that appear on the left margin of the text of the revised manuscript.

We uploaded revised manuscript, figure file, cover letter, and certificate from English editing service. Please find.

Sincerely yours,

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Responses to Editor’s comments

Editor 1) Language - We recommend that you ask a native English speaking colleague to help you copyedit the paper. If this is not possible, you may need to use a professional copyediting service. We suggest the 'Manuscript Presentation Service' based at the University of Aberdeen. Details and contact information are available from the following link http://www.biomedes.co.uk/. There are also suggestions for copyediting services in the 'Style and Language' section of our instructions to authors at http://www.biomedcentral.com/info/authors/.

RESPONSE: We had our revised manuscript be checked by commercially available editing service run in the UK. I will upload the copy of certificate issued by the editing service.

Editor 2) Abstract - Please could you expand the background section of your abstract. Guidelines on structuring your abstract can be found at the link below:
http://www.biomedcentral.com/info/ifora/abstracts

RESPONSE: We expanded the background section following the instruction at the above link.

Editor 3) Ethics - Experimental research that is reported in the manuscript must have been performed with the approval of an appropriate ethics committee. Research carried out on humans must be in compliance with the Helsinki Declaration (http://www.wma.net/e/policy/b3.htm), and any experimental research on animals must follow internationally recognized guidelines. A statement to this effect must appear in the Methods section of the manuscript, including the name of the body which gave approval, with a reference number where appropriate. Informed consent must also be documented. Manuscripts may be rejected if the editorial office considers that the research has not been carried out within an ethical framework, e.g. if the severity of the experimental procedure is not justified by the value of the knowledge gained.

RESPONSE: We added information on ethical approval and informed consent to the method section (line 86-89).

Editor 4) Competing interests - Please include a 'Competing interests' section between the Conclusions and Authors' contributions. If there are none to declare, please write 'The authors declare that they have no competing interests'.

RESPONSE: We do not have any competing interests, thus wrote 'The authors declare that they have no competing interests' in competing interests section (line 315-316).
Reviewer 1: Major Essential Revisions

REVIEWER 1: The data used came from an intervention study that is a worksite trial for the purpose of preventing cardiovascular disease. The intervention areas included diet, physical activity, and cessation of smoking. These factors are also risk factors for type 2 diabetes and probably also associated with sleep disturbances. Thus, these data are not optimal, to examine the association between sleep disturbances and risk of type 2 diabetes. The authors should therefore critical discuss, what influence the baseline study design could have on the incidence of type 2 diabetes, on other risk factors, on the risk estimates found in the study etc.

RESPONSE: We agree to the point that the intervention may influence the association between sleep and type 2 diabetes. We already adjusted for this intervention by including indicator variable for this intervention into the statistical model (model 2 and 3), and showed that adjusting for assigned intervention did not influence the results. However, we added the following sentence to the limitation section.

“Because we used data from an intervention study including diet, physical activity, and cessation of smoking, this might be a confounder in the association between sleep and type 2 diabetes, but we believe the impact must be small because adjustment for intervention did not influence the results.” (line 302-305)

REVIEWER 1: It is not clear, how was dealt with missing values on any of the considered characteristics. Were they excluded from analyses?

RESPONSE: We excluded 717 participants from the current analysis, those who had incident diabetes at the baseline survey conducted between 1999 and 2000, or those who did not report the quality or quantity of sleep (difficulty initiating sleep, difficulty maintaining sleep, and duration of sleep) at baseline. (This is already stated in the method section (line 81-85))

In addition to that, 8.9% of alcohol intake variable were missing. We dealt with these missing using dummy variable coding approach, and we thus added the following sentence to the statistical analysis section (line 155-156).

“Because alcohol intake variable had 8.9% of missing values, we modeled dummy variables for missing values of this variable.”

REVIEWER 1: Recent studies reported gender differences in sleep disorders, with better sleep quality as well as longer sleep times in women compared to men. Furthermore, other studies have found that the risk of type 2 diabetes in persons with sleep disturbances differ between men and women. Thus, it is recommended to conduct gender-specific analysis in the present study. The gender-specific results should be shown and discussed.

RESPONSE: The point raised was very important. We explored the interaction between gender and sleep by conducting likelihood ratio test, but we could not observe significant
interaction between frequency of difficulty initiating sleep and gender (p=0.82). We added this statistical analysis method (line 187-192) and results to the method and results section (line 223-224).

Reviewer 1: Minor Essential Revisions

Abstract:

REVIEWER 1: the authors should include the years, when the baseline examination was carried out, the follow-up (from …. until), and the age-range of the included participants.

RESPONSE: We added the information on years and age-range of participants (abstract).

REVIEWER 1: Are the included cases exclusively type 2 diabetes cases?

RESPONSE: Yes, we added this information to the abstract (abstract).

REVIEWER 1: In the Conclusions, it should be added that also medium frequencies of difficulty initiating sleep were associated with an elevated risk. Furthermore, the included number of men and women should be given.

RESPONSE: We added that medium frequency of difficulty initiating sleep was associated with an elevated risk. We added the information on % of women to method section of the abstract (abstract).

REVIEWER 1: Page 4, line 7: “normal quality of sleep” should be corrected into “abnormal quality of sleep”

RESPONSE: We corrected this (line 61).

REVIEWER 1: Page 4, lines 9 to 10: please give References (studies from the U.S. and Europe)

RESPONSE: We cited references (line 63).

REVIEWER 1: Page 5, line 13: I think, prevalent cases of diabetes were excluded

RESPONSE: Yes, we corrected this (line 82).

REVIEWER 1: Page 6, line 4: Were the blood samples collected in a fasting state?

RESPONSE: The blood sample was not necessarily collected in a fasting state, but we collected the information whether participants were in a fasting state or not. We were able to define diabetes because of this information. We added the following information to the method section.

“Details of whether participants were in a fasting state were also collected.” (line 95-96)
Results:

REVIEWER 1: the results section is very long and should be shortened. Some of the sentences can be omitted without loss of information.

Discussion: several sentences and statements are circumstantial and repeated within the discussion, thus this section also can be shortened and written more concise.

RESPONSES: We shortened this results and discussion section by omitting some sentences.
Reviewer 2: Major Essential Revisions

REVIEWER 2: I am concerned about the effects of sleep duration. In table 1 it is clear that the three groups of individuals with difficulty initiating sleep differed with regards to sleeping time, less than 6 hours was 14.3, 16.9 and 30.3. In the text, p 14, it is stated that the proportions were 14.2, 16.0 and 18.2. Is this a mistake?
RESPONSE: The figures in the text were not correct. We corrected the numbers in the text (line 236-237).

REVIEWER 2: I am not sure that the statistics in table 2 regarding sleep duration is accurate, especially whether less than 6 hours should be the comparison for all other duration groups. I would also like to know how many in the shortest sleep duration group developed diabetes.
RESPONSE: I agree to this point. I made the category of 6-7 hours the reference and performed re-analysis (table 2); the message from the results was the same—we did not observe significant association between sleep duration and risk of diabetes.

REVIEWER 2: Even though it is controlled for gender, I would like to know about differences among males and females.
RESPONSE: The point raised was very important. We explored the interaction between gender and sleep by conducting likelihood ratio test, but we did not observe significant interaction between frequency of difficulty initiating sleep and gender (p=0.82). We added this statistical analysis method (line 187-192) and results to the method and results section (line 223-224).

REVIEWER 2: My other concern is the reason for the analysis of quality of life. In my perspective it is reasonable to use this as construct validity. However, QoL may be included in the paper, but not for the stated reason.
RESPONSE: This is an important point. We explored the association between QOL and sleep in order to use this as construct validity, and stated as such in method section.