Reviewer’s report

Title: Long working hours and metabolic syndrome among Japanese men: a cross-sectional study

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Reviewer: Henrik Bøggild

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This is a cross-sectional study of 934 men from a Japanese company. The association between long working hours and metabolic syndrome was assessed in logistic regression models, adjusting for relevant potential confounders. The paper also examines the potential impact of age and shift work by restricting the analyses.

• Major Compulsory Revisions

1. Measures are partly described at p. 7. I miss a description of how measures of waist circumference, triglycerides, HDL, treatment for hypercholesterolemia or hypertension and blood pressure were conducted, and whether the health check-up was conducted in any specific time of the day. Having triglycerides, HDL and blood pressure measured could be influenced by strain, by having eaten just before the examination, by having rushed to work etc.

2. Several categories in occupational status (“sales”, “others” and “missing”), shift work, alcohol consumption and cohabiting (table 1) have very low numbers; how was this handled in the modelling (table 2, model 3), were they excluded?

3. Are the sociodemographic factors presented in the paper associated with metabolic syndrome in the sample and/or in the literature? Could any of them be left out in the final model in order to have more robust estimates? This should be expanded.

4. In table 1 sleeping seems to be heavily associated with working hours, but it doesn’t seem to be further investigated in the models. Why is this?

5. Especially occupational status “technicians” and "skilled" are respectively strongly associated and reversely associated with work hours (table 1). Also age seems to be inversely associated with working hours. How robust are the models – more information on this is needed. I find the restricted models very useful, could this be used further, restricting for instance to technicians or skilled workers alone?

6. I find that the results are not as clear as stated in the paper. In model 2 (table 2) adjusting for age, shows that the highest ratio is seen for the 8-9 hour group, this point estimate is further raised in the final model 3, while the >10 hour group has a lower point estimate in model 2 and only just reaches statistical significance in model 3 (2.31 (1.04-5.14)). The 9-10 hour group has a lower point estimate in both models, which is not commented on. The “benchmark” approach
(p. 11, l. 14) does not explain the pattern in the slightly elevated work hour group. Both in the restricted models (table 3, >40 year) and in the additional table the same pattern is seen with a modest elevated point estimate in the 9-10 hour group, a high ratio in the 8-9 hour group and estimates in the > 10 hour a day group, that have the highest estimate only in the fully adjusted model. This should in my opinion be further investigated and commented on. I suspect that the final model could cover for spurious results.

7. As stated, this is a cross-sectional study, and the conclusions drawn, both in the abstract and paper (p. 16), is not covered by the results. It is not possible to infer whether a reduction in working hours lowers the “risk” of metabolic syndrome or to judge whether reductions are a feasible prevention strategy. I would suggest rewriting the conclusion in order to downplay the implications of the study.

8. I find that the language needs a thorough revision

• Minor Essential Revisions
  1. In the tables I suggest including the number of participants in the models

• Discretionary Revisions
  1. The paper describes in sufficient detail how the original material came from 1664 invited workers to the 934 used. I would suggest, however, describing only the male population, from 1314 male workers to the 934 used. Instead the authors could explain in short that the female population was excluded due to lack of overtime. In line with this, the paragraph on “Characteristics of unanalysed participants” (p. 10) should also not mention the women population.

  2. I suggest using the term prevalence instead of risk (p. 16, l. 3: “...more than double the risk of metabolic...”), as the term “risk” implies a cause-and-effect association, that can’t be justified despite the discussion on p. 15.

  3. What is meant by “average sleeping hours” (p. 8, l. 1) – is it sleeping length?

  4. In “Statistical analyses” (p. 8) p-values are used to judge whether a value is statistical significant. The models give 95% CI and not p-values, which I find very relevant. I would therefore suggest not to mention the p-values, rephrasing the sentence to “A confidence interval excluding 1 was considered statistical significant” or something like that.

  5. On p. 9, 2. paragraph, l. 3: “...among workers with longer working hours were all above null”, should probably read: “...above one”?

  6. Table 1, p. 26, Sleeping. I suppose the (hours/day; Mean; SD) line is the mean sleeping length, while the next three lines are the table. This could be made more explicit.

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: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests