Reviewer’s report

Title: Obesity, blood pressure, glucose and lipid metabolism among permanent and fixed-term workers in the manufacturing industry: a cross-sectional study

Version: 1 Date: 1 May 2013

Reviewer: Karolina Szerencsi

Reviewer’s report:

Overall; this study concerns a cross sectional design in which the association between precarious work (fixed term) and health status (= obesity and lipid and glucose metabolism) is examined. They hypothesize that fixed term workers experience greater stress levels due to unstable employment (job insecurity), which leads to unhealthy lifestyles and in turn lead to sickness.

This study shows that fixed term workers showed unhealthy tendencies in terms of blood pressure, lipid and glucose metabolism although BMI was lower as compared to permanent workers. Due to lower SES or higher smoking rate?

Permanent workers had better blood pressure, lipid and glucose metabolism, but showed an unhealthy lifestyle as compared to fixed term workers: diet, exercise, drinking, higher BMI. Due to overtime work?

The comments listen below can be categorized as ‘Major Compulsory Revisions’. Some issues need clarification, such as the rationale, the definition of health status, whether the author checked the assumptions before using regression analyses. Furthermore, certain choices need clarification, e.g. why exclude those > 50 years of age?, more detailed description of the assessment of all variables used in the study.

In addition, some explanations given in the discussion are not supported (by the data): e.g. smoking could clarify the association between worse blood pressure, lipid and glucose and fixed term contract, while in the analyses adjustment has been performed for smoking.

The strobe checklist for observational studies (cross sectional) might be helpful for the reporting of the data and the description of the study.

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

a) The purpose of the study is defined as ‘to compare obesity, lipid and glucose metabolism and health related factors between permanent and fixed term workers employed in the manufacturing industry’ in the abstract, whereas in the paper (in the last sentence of the last paragraph of the background) it is formulated as ‘to compare health status in terms of obesity and lipid and glucose metabolism by contract types’. In the latter, the population is missing. Furthermore, how do you define your outcome? Please include a definition.
b) Furthermore, to define health status as obesity and lipid and glucose metabolism is strange to my opinion. Obesity and lipid and glucose metabolism are risk factors of health status. If you wish to study health status, why do you exclude hypertension, hyperlipidemia and diabetes (last sentence paragraph methods-study subjects)? These are more closer to health status.

c) Rationale of the study - do want to gain insight into whether fixed term and permanent workers differ in health status? Or specifically in indicators of health status, and if so why?

2. Are the methods appropriate and well described?

a) I do not agree with the statement ‘this factory treats permanent and fixed term workers identically in terms of physical safety because both are provided protective equipment. Thus, fixed term workers may experience similar working conditions as permanent workers, except for contract length, salary and working hours’.

What about job related tasks and psychosocial work characteristics, such as job demands, job control, role and task clarity etc (see Kompier et a 2009 ‘Employment contracts: cross sectional and longitudinal relations with quality if work life, health and well being’). How do the two groups differ with regard to the mean number of working hours per week? In the article only overwork (yes/ no) is given. Does the statement imply that fixed term and permanent workers have identical jobs (and tasks) within this factory? Do you have data to support this statement? Do you know anything about work history of the two groups and whether they differ? This information could offer insight into why there are differences between fixed and permanent workers in BMI, blood pressure, blood glucose and triglyceride.

b) Why did you exclude the workers aged 50-60 years? Do you expect differences in ‘health risks’ of fixed term contracts for those > 50 and < 50? If yes, why?

c) Do you know anything about the 119 employees for whom anthropometric and blood pressure data was missing? Did they differ in the distribution of contract type? Did they differ in working conditions or age, gender, smoking status etc?

d) Section ‘health data’, second paragraph: how was blood pressure assessed? Which instrument, more than one measure to reduce variability?

e) Section ‘health related lifestyles’:

Please describe how all variables were measured, e.g. formulate the questions how smoking status, exercise and alcohol consumption were inventoried. Please describe all categories and how the variables were adjusted for in the analyses? E.g. It is not clear from the text how many categories you have for alcohol: no drinker, drinker, heavy drinker. Do you use the same groups when you adjust for alcohol in the analyses or do you use the continuous answer scale (g ethanol per week)?

f) Please provide some information about the validity of the questions used to
assess health data and health related lifestyle variables (in the discussion section).

g) Did you measure socio-economic status? If yes, how?

h) Section statistical analysis, formulation of the sentence ‘multiple regression analysis was used to estimate and compare the BMI, blood pressure and glucose metabolism data.’ Strange sentence, what did you compare?

i) Were the assumptions for using regression analyses justified? Are the variables normally distributed? If not, what have you done with the data?

Have you examined whether there is a high correlation between the various independent variables for which you adjust? This is important because you want to prevent multi-colinearity.

j) Why do you adjust for lifestyle related variables in the results as presented in Table 4? What is the theory or hypothesis in this field on the role of smoking, alcohol, exercise, eating habits, sleep quality on the mechanism underlying the association between precarious work and health? Within research on work stress and health, these variables are considered as potential intermediates. Could this also apply to the association between fixed term work and health status (=obesity, lipid and glucose metabolism). If so, this should be discussed in the discussion section as well.

3. Are the data sound?

a) I question the validity of the health related lifestyle variables and the definition of the main outcome of this study. Please provide some data on the validity of the items used to assess the lifestyle variables.

b) The title of table 4 seems incorrect ‘regression model showing association of precarious employment and change in BMI, BP, lipid and glucose metabolism’. In the article nothing is mentioned about examining change in these variables. You use a cross sectional design.

c) I think it is strange that you use BMI as a continuous variable in table 4 and mention obesity in the title of the paper. I think you should examine BMI as continuous variable and mention BMI in the title or you should examine Obesity (BMI > 25 versus < 25) and then mention obesity in the title.

d) The presentation of the variables in table 2 should be clarified. It should be clear, without having to go back to the methods section or the description given in table 1, what alcohol means, for instance replace ‘alcohol’ by ‘alcohol consumption, yes’ and ‘sleep satisfaction’ by ‘sleep satisfaction is good’ etc.

e) Table 4, in the footnote the meaning of *, ** is missing.

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?

See comments above that relate to reporting of the data

5. Are the discussion and conclusions well balanced and adequately supported by the data?
a) I miss the discussion of whether or not to adjust for lifestyle related variables (are they confounders or intermediates) and whether adjustment for these variables strongly attenuated the association and what this could mean.

b) Please make clear the contribution is of this cross sectional study to this research field, what do we know more due to this study?

c) Section ‘Discussion- limitations’. I do not understand the reasoning of the author. First possible differences in work content and psychosocial characteristics between permanent and fixed term workers are mentioned to explain why permanent workers show worse blood pressure, lipid and glucose, then it is followed by the sentence ‘although these disadvantageous conditions exist…. they remain healthy to perform their jobs’ -> I do not understand this latter sentence in relation to the explanation of confounding?

d)6th paragraph of discussion ‘in terms of workers background, we did not examine SES or family in detail’ - Are all workers in the factory of high school graduate level? Or are there differences in educational level (as a measure for socio-economic status) among the workers and especially between permanent and fixed term workers? Otherwise the explanation given in the 7th paragraph of the discussion for the difference in BMI between permanent and fixed workers (which may be attributed to e.g. SES) is less likely. Or if the author means that it can be due to SES because fixed term workers have a lower salary (as indicator of SES), the author should discuss this interesting issue in more detail, since both (educational level and income) are often used as indicators of SES in the literature.

e)The issue of longitudinal assessments of outcome and life style variables and contract type should be discussed in more detail, since the lack of information on duration of contract type , duration of exposure to other work related factors (psychosocial work characteristics etc) limit the understanding of the findings. Could differences in exposure in contract type and lifestyle factors between the two groups contribute to the differences between the two groups? And if so, how?

f)In the 6th paragraph of the discussion it is stated ‘therefore, young permanent workers in our population…only recently’. The mean age was around 31 for permanent and 30 for fixed term workers? In the Netherlands, workers with high school education are 18 years old when they start working. If the same applies to Japan, the permanent workers cannot be considered as started working recently, since they already have at least 10 years of work experience.

g) one of the explanations that is given for the finding that fixed term workers showed unhealthy tendencies in terms of blood pressure, lipid and glucose metabolism although BMI was lower as compared to permanent workers, is smoking. The prevalence of smoking was higher among fixed workers, however in Table 4, the results are adjusted for smoking and the associations remain significant.
h) In the introduction two studies were mentioned that used objective data on blood pressure and BMI and examined the association with precarious work. What did these studies show? Was this in line with your findings? What did other studies on lifestyle factors (self reported) and precarious work find?

i) in the first paragraph of the discussion you refer to a study that showed an association between low SES and diabetes. Why? Diabetes is not part of your outcome, this was excluded, as well as hypertension and hyperlipidemia.

6. Are limitations of the work clearly stated?
Confounding by other factors which are not measured are stated in fifth paragraph (differences in other working conditions).
Selection of manufacturing workers from one factory -> why do you think that the findings might not be generalizable to all fixed term workers working in that industry? Were the working circumstances in the factory different from the working circumstances in other factories in that industry?
Overall, for various limitations mentioned, I miss the implication of the limitations on the results of the study. E.g. how would data on marital status influence the association between contact type and obesity and lipid glucose metabolism? E.g. it is reasoned that higher mental pressure among permanent workers would negatively impact mental health among permanent workers. What is the expected influence on lifestyle factors and BMI etc?
I miss the discussion of using a cross sectional design in examining the association between precarious work and health status.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
Background, third paragraph: there are two studies that have objectively assessed BMI and blood pressure and examined the association with fixed term contract type, what was the outcome of these studies? (MINOR revision)

Background, fourth paragraph, Is the hypothesis based on results of previous studies or theories/ models? Please include them.
As mentioned under 5h) I miss the results of other studies for comparison of the results of the current study with the results of other studies regarding BMI, diet, exercise, blood pressure etc among fixed term workers as compared to permanent workers.

8. Do the title and abstract accurately convey what has been found?
Title: In the aim of the study, as formulated at the end of the background, health status is defined as obesity and lipid and glucose metabolism, whereas the title also contains blood pressure.

Abstract:
Background: the rationale of the study should be more clearly given, why is objective clinical data important? Why is this study important, what does this study add to the current knowledge on this topic?

Method: Design of the study. How did you perform the analyses and for which factors did you adjust?

Conclusion: You did adjust your analyses for smoking, so why do you think it might cause the association?

9. Is the writing acceptable?

The writing should be improved as there are several strangely formulated sentences and grammatical errors.

E.g. in abstract, background ‘A precarious form of employment is recognized as a factor of social determinants of health’ I did not understand the meaning of this sentence, only after reading the first sentence of the introduction.

In the abstract ‘Evidences examined by objective clinical measurements were quite limited’? Do you mean ‘Evidence that supports precarious employments as a risk factor for health, is mainly based on subjective data for health, whereas evidence using objective clinical measurements for the assessment of health status is limited’?

E.g. in the main paper – Methods section: ‘study subjects were manufacturing industry workers in a company in the Chobu region of Japan, which employs both permanent and fixed workers’. ‘whereas fixed term workers employment term with the targeted company was 6 months’. ‘thus, fixed term workers may experience working conditions similar to those of permanent workers’

Above Results section: ‘Finally a multiple regression analysis was used to estimate and compare the BMI, BP and metabolism data’

Results section, 4th paragraph ‘table 4 shows the …to examine the relationship of BMI, blood pressure and metabolism to contract type’.

Title table 3 ‘comparison of … between permanent and fixed term workers’

However, overall, the writing does not strongly hinder understanding of the content of the paper.

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests